

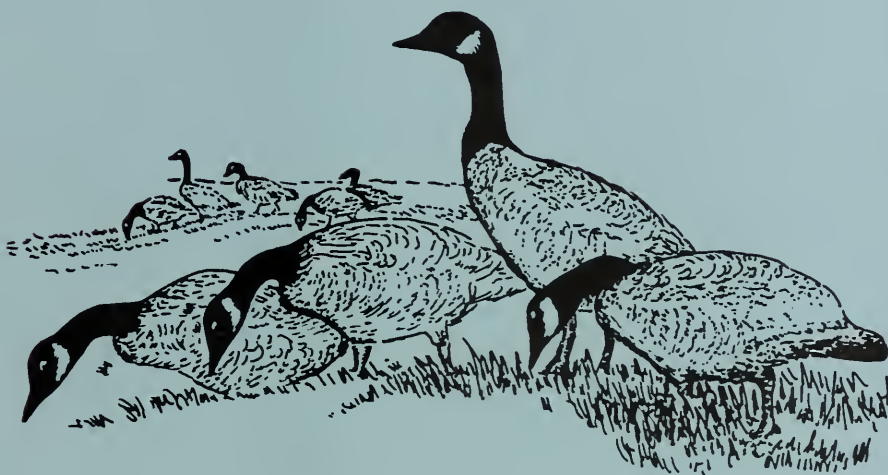
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GOOSE CREEK WATERSHED

LINCOLN COUNTY, WASHINGTON



PLAN & ENVIRONMENTAL IMPACT STATEMENT

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

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ADDENDUM

Goose Creek Watershed Plan, Washington

The plan shows an evaluation of the project structural measures using 1974 installation costs and a discount rate of 6-1/8 percent.

This addendum shows the project costs, benefits, and benefit-cost ration based on 6-1/8 percent interest rate, 1976 installation costs, and current normalized prices for agricultural commodities. Annual project costs, benefits and benefit-cost ratio are as follows:

1. Project costs are \$192,500.
2. Project benefits afr \$358,800.
3. The project benefit-cost ration is 1.9:1.
4. Project benefits without secondary benefits are \$349,100.
5. The project benefit-cost ratio without secondary benefits is 1.8:1.

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PLAN AND
ENVIRONMENTAL IMPACT STATEMENT

GOOSE CREEK WATERSHED
Lincoln County, Washington

Prepared under the Authority of the Watershed Protection and Flood Prevention Act (Public Law 566, 83d Congress, 68 Stat. 666), as amended, and in Accordance with the National Environmental Policy Act of 1969, Section 102 (2) (c) Public Law 91-190.

Prepared by:
Lincoln County Conservation District
Town of Wilbur
Town of Creston

With Assistance by:
U.S. Department of Agriculture, Soil Conservation Service

April 1976

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AGREEMENT

between the

Lincoln County Conservation District

Town of Wilbur

Town of Creston

(hereinafter referred to as the Sponsoring Local Organization)

State of Washington

and the

Soil Conservation Service

United States Department of Agriculture

(hereinafter referred to as the Service)

Whereas, application has heretofore been made to the Secretary of Agriculture by the Sponsoring Local Organization for assistance in preparing a plan for works of improvement for the Goose Creek Watershed, State of Washington, under the authority of the Watershed Protection and Flood Prevention Act (Public Law 566, 83d Congress; 68 Stat. 666), as amended: and

Whereas, the responsibility for administration of the Watershed Protection and Flood Prevention Act, as amended, has been assigned by the Secretary of Agriculture to the Service: and

Whereas, there has been developed through the cooperative efforts of the Sponsoring Local Organization and the Service a mutually satisfactory plan for works of improvement for the Goose Creek Watershed, State of Washington, hereinafter referred to as the plan, which is annexed to and made a part of this agreement:

Now, therefore, in view of the foregoing considerations, the Sponsoring Local Organization and the Secretary of Agriculture, through the Service, hereby agree on the plan, and further agree that the works of improvement as set forth in said plan can be installed in about 10 years.

It is mutually agreed that in installing and operating and maintaining the works of improvement substantially in accordance with the terms, conditions, and stipulations provided for in the plan:

1. The Sponsoring Local Organization will acquire such landrights as will be needed in connection with the works of improvement. The percentages of this cost to be borne by the Sponsoring Local Organization and the Service are as follows:

<u>Works of Improvement</u>	<u>Sponsoring Local Organizations</u> (percent)	<u>Service</u> (percent)	<u>Estimated Land Rights Cost</u> (dollars)
Multipurpose Structure			
Payment to landowners for about 366 acres	51.37	48.63	142,140
Legal fees, survey costs, and other	100	0	9,250
Recreational facilities			
Payment to landowners for about 114 acres	50	50	23,000
Legal fees, survey costs, and other	100	0	1,000
All other structural Measures	100	0	10,060

The Sponsoring Local Organization agrees that all land acquired or improved with P.L. 566 financial or credit assistance will not be sold or otherwise disposed of for the evaluated life of the project except to a public agency which will continue to maintain and operate the development in accordance with the Operation and Maintenance Agreement.

2. The Sponsoring Local Organization assures that comparable replacement dwellings will be available for individuals and persons displaced from dwellings, and will provide relocation assistance advisory services and relocation assistance, make the relocation payments to displaced persons, and otherwise comply with the real property acquisition policies contained in the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Public Law 91-646, 84 Stat. 1894) effective as of January 2, 1971, and the Regulations issued by the Secretary of Agriculture pursuant thereto. The costs of relocation payments will be shared by the Sponsoring Local Organization and the Service as follows:

	<u>Sponsoring Local Organization</u>	<u>Service</u>	<u>Estimated Relocation Payment Costs</u>
	(percent)	(percent)	(dollars)
Relocation Payments	48.1	51.9	34,500

3. The Sponsoring Local Organization will acquire or provide assurance that landowners or water users have acquired such water rights and storage permits pursuant to State law as may be needed in the installation and operation of the works of improvement.
4. The percentages of construction costs of structural measures to be paid by the Sponsoring Local Organization and by the Service are as follows:

<u>Works of Improvement</u>	<u>Sponsoring Local Organization</u>	<u>Service</u>	<u>Estimated Con- struction Cost</u>
	(percent)	(percent)	(dollars)
Multipurpose Structure	20.72	79.28	1,375,840
Recreation Facilities	50.0	50.0	182,100
All other struc- tural measures	0	100	92,080

5. The percentages of the engineering costs to be borne by the Sponsoring Local Organization and the Service are as follows:

Works of Improvement	Sponsoring Local Organization (percent)	Service (percent)	Estimated Engineering Costs (dollars)
Recreation Facilities	50.0	50.0	14,000
All other structural measures	0	100	172,600

6. The Sponsoring Local Organization and the Service will each bear the costs of project administration which it incurs, estimated to be \$18,700, and \$250,000, respectively.
7. The Sponsoring Local Organization will obtain agreements from owners of not less than 50 percent of the land above each reservoir and floodwater retarding structure, that they will carry out conservation plans on their land.
8. The Sponsoring Local Organization will provide assistance to landowners and operators to assure the installation of the land treatment measures shown in the plan.
9. The Sponsoring Local Organization will encourage landowners and operators to operate and maintain the land treatment measures for the protection and improvement of the watershed.
10. The Sponsoring Local Organization will be responsible for the operation and maintenance of the structural works of improvement by actually performing the work or arranging for such work in accordance with agreements to be entered into prior to issuing invitations to bid for construction work.
11. The costs shown in this agreement represent preliminary estimates. In finally determining the costs to be borne by the parties hereto, the actual costs incurred in the installation of works of improvement will be used.

12. This agreement is not a fund obligating document. Financial and other assistance to be furnished by the Service in carrying out the plan is contingent on the availability of appropriations for this purpose. A separate agreement will be entered into between the Service and the Sponsoring Local Organization before either party initiates work involving funds of the other party. Such agreement will set forth in detail the financial and working arrangements and other conditions that are applicable to the specific works of improvement.
13. The plan may be amended or revised, and this agreement may be modified or terminated only by mutual agreement of the parties hereto except for cause. The Service may terminate financial and other assistance in whole, or in part, at any time whenever it is determined that the Sponsoring Local Organization has failed to comply with the conditions of the agreement. The Service shall promptly notify the Sponsoring Local Organization in writing of the determination and the reasons for the termination, together with the effective date. Payments made to the Sponsoring Local Organization or recoveries by the Service under projects terminated for cause shall be in accord with the legal rights and liabilities of the parties.
14. No member of or delegate to congress, or resident commissioner, shall be admitted to any share or part of this agreement, or to any benefit that may arise therefrom; but this provision shall not be construed to extend to this agreement if made with a corporation for its general benefit.
15. The program conducted will be in compliance with all requirements respecting nondiscrimination as contained in the Civil Rights Act of 1964, as amended, and the regulations of the Secretary of Agriculture (7 C.F.R. 15.1-15.12), which provide that no person in the United States shall, on the ground of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination under any activity receiving federal financial assistance.
16. This agreement will not become effective until the Service has issued a notification of approval and authorizes assistance.

Lincoln County Conservation District
Local Organization

By Robert E. Kule

Title Chairman

Address RT 11 Box 1K

Olney, Wash. 99159
Zip Code

Date 5-12-76

The signing of this agreement was authorized by a resolution of the governing body of the Lincoln County Conservation District, adopted at a meeting held on May 12, 1976.

Jerry Benson Sec.
(Secretary, Local Organization)

Address Box 21

Lamona Wash. 99144
Zip Code

Date 5/12/76

Town of Wilbur
Local Organization

By

Title

Address

Zip Code

Date

The signing of this agreement was authorized by a resolution of the governing body of the Town of Wilbur, adopted at a meeting held on

May 5, 1976

(Secretary, Local Organization)

Address

Zip Code

Date

Town of Creston
Local Organization

By Ronald F. M. Kay

Title Mayor

Address Creston Wash

Box 106 99117
Zip Code

Date May 6, 1976

The signing of this agreement was authorized by a resolution of the governing body of the Town of Creston, adopted at a meeting held on May 6, 1976.

Harriet Hayden Albrecht
(Secretary, Local Organization)

Address Box 131

Creston, Ida 99117
Zip Code

Date May 6, 1976

Appropriate and careful consideration has been given to the environmental statement prepared for this project and to the environmental aspects thereof.

Soil Conservation Service
United States Department of Agriculture

Approved by:

Dwain S. Bridge
State Conservationist

5/13/76
Date

PLAN
GOOSE CREEK WATERSHED
Lincoln County, Washington

SUMMARY

Goose Creek Watershed includes 63.8 square miles (40,818 acres) in Lincoln County, northeast Washington. Goose Creek is joined by Sherman Creek 4 miles upstream of the town of Wilbur. Goose Creek then flows southwest joining Sinking Creek and becomes Wilson Creek. Wilson Creek then flows southwest and enters Crab Creek at the town of Wilson Creek.

The watershed project is sponsored by Lincoln County Conservation District, the town of Wilbur, and the town of Creston.

The major problem to be corrected by the proposed project is flooding in the towns of Wilbur and Creston. A warm wind and rain occurring when snow covers frozen ground produces flooding. Approximately 14.0 acre feet of sediment is produced in the watershed annually, creating another problem. This becomes the greatest pollutant of water within the watershed.

Under the proposed project, land treatment measures to reduce erosion and rainfall runoff will be installed by individual landowners and operators. Technical assistance will be provided by the Soil Conservation Service (SCS). Appropriate land treatment measures include: level terraces, gradient terraces, stripcropping, crop residue use, chiseling, grassed waterways, mulching, debris basins and structures, deferred grazing, proper grazing use, divided slope and stripcropping, and conservation cropping systems.

Structural measures include a multipurpose, flood control and recreation dam; recreation facilities; channel work in the town of Wilbur; and minor flood control structures and diversion channels for the town of Creston.

It is estimated that 4 years will be required to install the structural measures and 10 years, for installation of land treatment measures.

Proposed measures will reduce erosion by 30 percent, and the amount of sediment contributed by the watershed, 73 percent.

Structural measures will protect the towns of Wilbur and Creston from the type of storm that occurs on the average of one time in 100 years (1 percent chance of occurrence).

Total project cost is estimated at \$3,951,700, of which \$2,052,030 is PL-566 and \$1,899,670 is other cost. Average annual cost for installation of structural measures is \$154,810, which includes \$28,520 for operation and maintenance.

Benefits from the structural measures are estimated at \$358,800 annually. These benefits, when compared to annual cost, including project administration, provide a benefit-cost ratio of 2.1 to 1.

Operation and maintenance of the structural measures will be performed as follows: Multipurpose structure and channel work in Wilbur, by the Town of Wilbur; recreational facilities, by the town of Wilbur, until a recreation district is formed to take over these responsibilities; and work installed in the area of Creston, by the Town of Creston.

INTRODUCTION

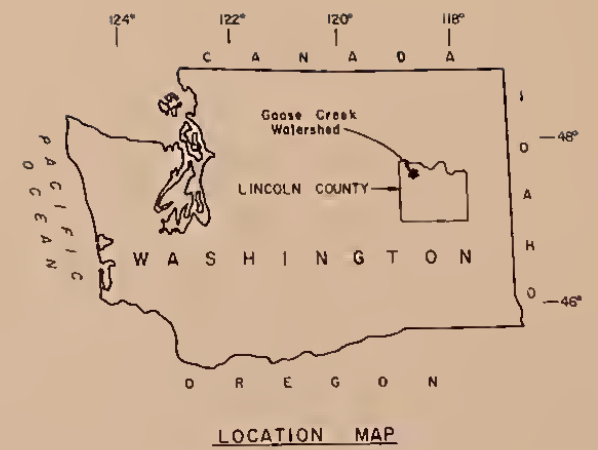
This plan has been briefed to avoid excessive duplication with information required in the Environmental Impact Section. Part II should be reviewed for additional information on the following items: Planned Project, Environmental Setting, Water and Related Land Resource Problems, Projects of Other Agencies, Environmental Impact, Alternatives, Consultation and Review with Appropriate Agencies and Others, and Preliminary Engineering Drawings.

PLANNED MEASURES

Land treatment measures to be installed on rangelands include deferred grazing and proper grazing use. On cropland, land treatment measures are divided slope and stripcropping, stubble mulch, crop residue use, chiseling, debris basins, grade stabilization structures, gradient terraces, level terraces, grassed waterways and streambank protection. It is anticipated that 75 percent of the needed conservation land treatment will be installed during the 10-year installation period.

Structural measures include a multipurpose flood control and recreation structure and recreation facilities located on Goose Creek above Wilbur. This structure will be a 58 feet high dam, 1,600 feet long, impounding a recreational pool of 235 acres. The storage of 6,800 acre feet will contain 3,450 acre feet for flood prevention, 2,226 acre feet for recreation, and 1,124 acre feet for sediment storage. Recreation facilities on 114 acres will include provisions for overnite camping, picnicking, hiking and fishing.

Other structural works will include channel work on 750 feet of Goose Creek within the town of Wilbur, and minor flood control structures and diversion channels for the town of Creston. These structures will control runoff from 75 percent of the drainage area above town. One structure will provide sediment storage and reduce peak flows within Creston, while a second structure will divert water from Creston into a diversion channel.



PROJECT MAP
GOOSE CREEK WATERSHED
LINCOLN COUNTY, WASHINGTON

SCALE 1:126,720

0 1 2 3 MILES



INSTALLATION COSTS - MONETARY

Land Treatment Costs

Estimated costs of installing land treatment measures are about \$1,330,430, as shown on Table 1. The figures shown represent the costs of actually applying the land treatment practices on the land. The costs, as estimated, are for expenditures that will be made by district cooperators and others in performing the work and in purchasing needed materials. They are based on Agricultural Stabilization and Conservation Program records and local experience of the Soil Conservation Service.

Technical assistance to apply these measures will be furnished by the Soil Conservation Service, cooperating with the Lincoln County Conservation District. These costs include salaries and associated costs incurred by technicians who will assist owners and operators in applying the measures, and are estimated to be \$29,600 annually. Of this, \$25,000 will be borne by PL-566 funds, and \$4,600 allocated from the ongoing program.

Structural Measure Costs

The estimated costs of installing structural measures, including construction, engineering, project administration, land rights and relocation costs, are shown in Tables 1 and 2.

(Relocation Costs)

Installation of the multiple-purpose structure will result in the relocation of three farmsteads. Cost sharing percentages for relocation costs are based upon the ratio of PL-566 funds and other funds to the total project costs, minus relocation costs. These costs are estimated to be \$17,905 (PL-566) and \$16,595 (Other). Included in the relocation costs would be costs of moving and replacement housing. Relocation Assistance Advisory Services of \$5,000 will be provided by Other funds without PL-566 cost sharing.

(Construction Cost)

The construction cost is based on engineering estimates of quantities required to provide project structures in accordance with current Soil Conservation Service Engineering Standards. It includes materials, labor, and machinery involved in construction. These quantities, multiplied by the unit construction costs applicable for this area and increased by a contingency factor of 15 percent, becomes the total estimated construction cost of \$1,650,020: PL-566, \$1,273,895; Other, \$376,125.

(Engineering Services)

Engineering Services include direct costs of surveys, investigations, design, and preparation of plans and specifications for structural measures. Engineering costs are estimated at \$186,600: PL-566, \$179,600; Other, \$7,000.

(Project Administration)

This category includes costs associated with the installation of structural measures, such as contract administration and necessary construction inspection during the installation period; relocation assistance advisory services also are included. Estimated costs of Project Administration are \$268,700; PL-566, \$250,000; Other, \$18,700.

(Other Costs - Land Rights)

This item includes all elements of construction, administration, engineering and legal services associated with acquiring such land rights, including removal and salvage of building and improvements or changes in telephone, power, water and sewer lines, or other utilities. Acquiring the associated construction permits, licenses, and insurance is a land rights cost. Land required is that needed for the construction and occupancy of project structural measures, borrow areas, and for the storage of water for flood prevention and recreational purposes. Estimated costs of land rights are \$185,450; PL-566, \$80,630; Other, \$104,820.

(Cost Allocation)

The use of facilities method of cost allocation was used on the multiple-purpose structure. The rest of the structural measures, except the recreational facilities, are single purpose structures and are allocated to flood prevention. The recreation facilities are allocated to recreation.

The multipurpose structure costs are allocated as follows:

1. Construction, engineering, and relocation payment costs are allocated 58.56 percent flood prevention and 41.44 percent recreation.
2. Land rights costs are allocated 2.73 percent flood prevention and 97.27 percent recreation for the area to be purchased. Of the 366 acres required, 356 acres are allocated to recreation and 10 acres to flood prevention. The 356 acres includes the damsite, spillway and reservoir area. The 10 acres are for an area of flooding on the upstream arm of the reservoir.

(Cost Sharing)

The following will be paid by PL-566 funds:

1. Construction costs of the multiple-purpose reservoir allocated to flood prevention, and one-half the cost allocated to recreation. This amounts to 79.28 percent of the construction cost or an estimated \$1,090,765.
2. Total construction cost of the Goose Creek channel work, estimated to be \$30,000.
3. Total construction cost of the Creston diversion, estimated to be \$62,080.
4. One-half of the cost of Recreation Facilities, estimated to be \$91,050.
5. All Engineering Service cost associated with the multiple-purpose reservoir, channel work, and the Creston diversion, estimated to be \$172,600.
6. One-half the engineering service costs on recreation facilities, estimated to be \$7,000.
7. Relocation costs associated with the reservoir based on a percentage of total PL-566 funds to total project funds without the relocation costs. This is 51.9 percent or an estimated \$17,905.
8. All Project Administration costs incurred by the Service, estimated to be \$250,000.
9. Cost of land rights allocated to recreation, not to exceed 50 percent. These costs are estimated to be \$80,630.
10. Accelerated land treatment technical assistance, estimated to be \$250,000.

The following will be borne by other than PL-566 funds:

1. Cost of installing land treatment measures on the watershed lands, estimated to be \$1,376,430.
2. One-half the cost of construction of the multiple-purpose structure allocated to recreation. This amounts to 20.72 percent of the construction cost, or an estimated \$285,075.
3. One-half the cost of Engineering Services associated with the recreation facilities, estimated to be \$7,000.

4. The total cost of relocation assistance advisory services, estimated to be \$5,000.
5. All project administration costs incurred by the local sponsors, estimated to be \$13,700.
6. The cost of acquiring land and water rights associated with flood prevention, at least 50 percent of the cost of landrights for recreation, and all easements. Estimated to be \$104,820.
7. One-half the cost of the recreation facilities, estimated to be \$91,050.
8. Relocation costs associated with the reservoir based on a percentage of total Other funds to total Project funds, without the relocation costs. Estimated to be 48.1 percent or \$16,595.

Installation of the project will be over a 10-year period, with the work of installing structural measures in the first 4 years, and the installation of land treatment measures continuing through the 10-year period.

The following schedule shows the anticipated rate of expenditure of funds by fiscal year:

Fiscal Year	Structural Measures		Land Treatment		Total
	PL-566 Funds	Other Funds	PL-566 Funds	Other Funds	
First	316,750	125,640	25,000	137,640	605,030
Second	1,169,550	297,850	25,000	137,640	1,630,040
Third	161,150	96,050	25,000	137,640	419,840
Fourth	154,580	3,700	25,000	137,640	320,920
Fifth			25,000	137,640	162,640
Sixth			25,000	137,640	162,640
Seventh			25,000	137,640	162,640
Eighth			25,000	137,640	162,640
Ninth			25,000	137,640	162,640
Tenth			25,000	137,670	162,670
TOTALS	1,802,030	523,240	250,000	1,376,430	3,951,700

BENEFITS - MONETARY

Present average annual flood damages total \$162,000. The structural works of improvement and land treatment measures will eliminate these damages. Formation of the reservoir and recreation facilities will produce \$187,100 annual recreation benefits. Local secondary benefits "stemming from and induced by" the project total \$9,700. Secondary benefits from a national viewpoint were not considered pertinent to the project. In addition, there are unevaluated benefits to downstream property, agricultural lands, and local health and safety.

COMPARISON OF BENEFITS AND COSTS

The annual benefits resulting from the structural works of improvement are \$358,800. The average annual cost of structural measures (including all operation, maintenance, and replacement costs) will be \$171,310 (tables 4 and 6). This relationship of benefits to cost provides a ratio of 2.1 to 1. The ratio of benefits to cost, without local secondary benefits included, is 2.0 to 1.

INSTALLATION PROVISIONS

This plan will be carried out as a joint undertaking of nonfederal sponsors and the Federal Government. Nonfederal interests include individual landowners and operators, the town of Wilbur, the town of Creston, and the Lincoln County Conservation District. Sponsoring organizations, at a later date, may request the Soil Conservation Service to administer all project construction contracts.

Construction plans and specifications for contracting will be completed after land rights, water rights, and storage permits are secured. Installation of land treatment measures will extend over 10 years.

Structural works of improvement will be installed within a 4 year period. In order to make efficient use of personnel and to realize most benefit from structural measures, the works of improvement will be installed in the following yearly sequence:

- 1st No construction.
 Land rights of multipurpose structure and recreation facilities.
 Relocation payments.
 Engineering of multipurpose structure.
- 2nd Land rights on Creston works and Wilbur channels.
 Construction of multipurpose structure.
 Engineering of recreation facilities.
- 3rd Construction of recreation facilities.
 Engineering of Creston works and Wilbur channel.
- 4th Construction of Creston works and Wilbur channel.

Land treatment measures installed on private property are the responsibility of the individual landowner. Technical assistance for the installation of land treatment measures will be furnished through the going program assistance by the SCD and through additional funds supplied by PL-566 to accelerate the application of land treatment measures.

Financial assistance for the application of conservation practices may be available to eligible landowners or operators from the Lincoln County Agricultural Stabilization and Conservation Service.

The town of Wilbur, until a recreation district is formed to take over these responsibilities, will acquire necessary land rights, for the multipurpose structure and recreation facilities, through negotiation or by exercise of eminent domain. Where land rights are to be acquired by negotiation, an appraisal must be made, just compensation must be established, and a written offer made to the owner of the land right to be acquired.

The land rights interest to be acquired must be appraised by a qualified land appraiser. The appraisal must be done in a manner consistent with the Uniform Appraisal Standards for Federal Land Acquisitions as published in 1972 by the Interagency Land Acquisitions Conference. These land rights, as well as water rights and storage permits, will be acquired prior to construction.

The town of Wilbur, until a recreation district is formed to take over these responsibilities, will make available the nonfederal share of the cost of construction, land right and engineering services allocated to recreation. The engineering for the recreation facilities will be done by an A&E firm and the contract cost will be shared by SCS and the district.

Cost of Relocation Assistance Advisory Services will be carried out by the Sponsor of the multipurpose reservoir and recreation facilities. The Sponsor will personally or by first class mail provide written notice of displacement with appropriate application forms to each individual, family, or farm operation to be displaced; assist in filing applications, review and take action on applications for relocation assistance; review and process grievances in connection with displacement; and make relocation payments. All displaced persons will be given at least 90 days' notice to vacate; at which time, decent, safe, and sanitary replacement housing will be made available.

Lincoln County Conservation District, organized under Washington State law, is empowered to enter into agreements and contracts, to sue and to be sued, to carry out soil and water conservation operations. They will be responsible for the conservation land treatment through district-cooperator agreements.

Town of Wilbur, incorporated under Washington State law, will be responsible for land rights for the channel work through Wilbur and the costs of landrights and construction for the multipurpose structure allocated to flood protection. The town will also be responsible for the local share of land rights, construction, and engineering for the multipurpose reservoir and recreation facilities allocated to recreation, until a recreation district is formed to assumed the responsibilities.

Town of Creston, incorporated under Washington State law, will be responsible for providing land rights for the floodwater diversion and structures around the town of Creston.

Washington State Game Commission, through the Department of Game, will enter into an agreement with the sponsors for the installation of boat ramp and parking facilities associated with the recreational facilities. The Commission will manage the fishing resources and the establishment and restocking of those resources within the recreation reservoir. The Commission will manage and protect fish and wildlife of the area as provided by State law.

The Soil Conservation Service, USDA, has departmental leadership for the Watershed Protection and Flood Prevention Act (PL-566) and provides technical service to the Lincoln County Conservation District through an existing cooperative agreement. The Service will provide the federal share of construction cost, engineering services, land rights costs, relocation costs, and project administration for the project upon completion of appropriate agreements. The Service will also provide their share of the engineering contract on the recreation facilities. Continued technical assistance will be provided for land treatment measures under the cooperative agreement with the Lincoln County Conservation District. Additional technical assistance for land treatment will be provided, using PL-566 funds, once appropriate agreements have been signed.

The Washington State Department of Ecology is the agency designated by the Governor to take the leadership in coordinating assistance by state agencies to watershed projects. The Department will give priority to the Goose Creek Watershed and will consult with the sponsors and assist them technically and financially on behalf of the state government to the extent practical.

OPERATION AND MAINTENANCE PROVISIONS

Operation and maintenance costs include all necessary expenditures after installation to realize the estimated benefits during the 100-year project evaluation period.

The town of Wilbur will assume responsibility for operation and maintenance of the multipurpose structure upon its completion. The reservoir will be operated to use the storage to an elevation of 2218.5 feet for recreational purposes.

By November 1 of each year, the gated outlet at elevation 2214.5 will be opened to draw the reservoir level down for flood control. This gate will remain open until March 15 of the following year, at which time it will be closed to allow the reservoir to fill for recreational purposes. The town of Wilbur will have control of the gated outlet.

The operation and maintenance work on the multipurpose structure will consist of such items as: repairing damage to structural embankment and emergency spillway, making replacements and repairs as needed, removing trash from the permanent pool, control of undesirable vegetation on the embankment and emergency spillway areas. Also included is the operation and maintenance of the gated outlet on the principal spillway and stream gages.

The town of Wilbur will also assume responsibility of the operation and maintenance of channel work installed as part of the project. This work would consist of such items as controlling adverse vegetative growth and removing debris and/or excavation of shoal deposits, as required, to reduce serious bank erosion and maintain the design channel capacity. Additional items may be the repair of critical areas by seeding or placement of stone or rip rap, and repair or replacement of appurtenances.

The town of Creston will be responsible for operation and maintenance work associated with the works of improvement to be installed to relieve the flooding problem in Creston. Items of work will include controlling adverse vegetative growth, repair of critical areas, repair or replacement of appurtenances, and any work required to maintain the capacity of the diversions.

The town of Wilbur will be responsible for operation, maintenance and replacement of the recreational facilities until a recreation district is formed to take over the responsibility. Cost involved facilities. A schedule of 25-year replacement of nondurable facilities was developed. Water purchased from the Bureau of Reclamation at a cost of \$0.287 per acre foot will be a part of operation and maintenance.

An agreement between the sponsors and the Bureau of Reclamation will be signed prior to construction of the project. Replacement water will be pumped from Lake Roosevelt and transported to Potholes Reservoir through existing distribution systems.

To realize project benefits, a periodic restocking of the reservoir will be needed to maintain a quality fishery. Maintenance of a successful trout fishery in Goose Creek reservoir will be dependent on a program of controlling undesirable species of fish. Periodic stocking to maintain trout fishery will be carried out by the Washington State Department of Game under an agreement to be signed with the recreation district.

All operation and maintenance activities will be conducted in a manner to minimize adverse environmental effects.

SCS and the sponsors will make a joint inspection annually and after unusually severe floods, and after occurrence of any unusual conditions that might adversely affect the structural measures. These inspections will continue for 3 years following the installation of each structure. Inspections after the third year will be made annually by the sponsors. They will prepare a report and send a copy to the SCS. Appropriate officials of the Washington State Department of Ecology and local public health officials will be invited to participate in all inspections.

An operation and maintenance agreement, detailing responsibilities of the sponsor and the SCS regarding establishment period and other items, will be executed prior to signing land rights or project agreements.

Operation and maintenance schedules will be prepared for each structural measure and will follow procedure as set up in the State Watershed O&M Handbook.

The O&M agreement will include specific provisions for retention and disposal of property acquired or improved with PL-566 financial assistance.

The town of Wilbur, the recreation district to be formed, and the town of Creston all have the authority to finance operation and maintenance work assigned to them by either taxation or special assessment.

The total estimated amount of operation, maintenance, and replacement cost is \$28,520. This includes the cost of operation, maintenance, and replacement for the recreation development which is \$13,625. Lake rehabilitation and restocking is \$7,120: \$750 for the Creston diversion, \$500 for the Wilbur channel work, and \$6,525 for the multipurpose structure.

The land treatment measures will be operated and maintained by owners and operators of the farms under agreement with the Lincoln County Conservation District. Technical assistance will be provided by the Soil Conservation Service.

FINANCING PROJECT

The town of Wilbur and the town of Creston will be responsible for the financing of installation costs not covered by PL-566 funds. These local sponsors each have authority to levy taxes and the power of eminent domain.

Federal share of the costs will come from funds appropriated under authority of PL-566, 83d Congress, 68 Stat. 666, as amended. This plan does not constitute a financial document for the obligation of either federal or other funds. Financial or other assistance to be furnished by the Service in carrying out the plan is contingent upon appropriation of funds for this purpose.

Prior to entering into agreements that obligate funds of the SCS, the responsible local sponsor will have a financial management system for control, accountability, and disclosure of PL-566 funds received, and for control and accountability for property and other assets purchased with PL-566 funds.

Program income earned during the grant period will be reported on the sponsor's request for advance of reimbursement from the SCS.

A recreation district will be formed through the Lincoln County Commissioners, to perform duties on behalf of the present sponsors, and will have power under State law to plan, install, operate, and maintain improvements for recreational purposes. The district's boundaries will be formed to closely follow existing school district boundaries of Wilbur and Creston. The district will have a tax base adequate to raise the estimated costs to be incurred by local sponsors.

Financing of relocation payment and relocation assistance advisory service costs will be by the same means as other costs.

All donations, such as land, right-of-way easements, labor, material, equipment, services, or money, will be used to finance the other than PL-566 cost. Where applicable, sponsoring local organizations may receive credit for such contributions toward their required cost sharing if it is agreed to in advance of performance.

Sponsoring local organizations have analyzed their financial needs in consideration of the scheduled installation of works of improvement. Negotiations are underway with the State Director of Farmers Home Administration for a watershed loan to cover local costs, including the filing of a preliminary application. Land rights to be purchased with the loan include 520 acres for the reservoir and recreation facilities, 59 acres for the Creston area project, and 13 acres for channel work in Wilbur.

TABLE 1 - ESTIMATED PROJECT INSTALLATION COST

Goose Creek Watershed, Washington

Installation Cost Item	Unit	Number		Estimated Cost (Dollars) 1/				TOTAL
		Non-Fed. Land	Total	PL-566 Funds		Other		
				Non-Fed. Land SCS 3/	Total	Non-Fed. Land SCS 3/	Total	
LAND TREATMENT								
Land Areas 2/ Rangeland Cropland	Acres to be treated	4,050 19,475	4,050 19,475			4,500 1,325,930 46,000 1,376,430	4,500 1,325,930 46,000 1,376,430	4,500 1,325,930 296,000 1,626,430
Technical Assistance				250,000 250,000	250,000 250,000			
TOTAL LAND TREATMENT								
STRUCTURAL MEASURES								
Construction								
Creston Diversion	Ft.	7,425	7,425	62,080	62,080			62,080
Rec. Facilities	Ea.	1	1	91,050	91,050	91,050	91,050	182,100
Channel (M) 4/	Mi.	.76	.76	30,000	30,000			30,000
Multipurpose Structure	Ea.	1	1	1,090,765 1,273,895	1,090,765 1,273,895	285,075 376,125	285,075 376,125	1,375,840 1,650,020
Subtotal-Construct.				179,600	179,600	7,000	7,000	186,600
Engineering Services								
Relocation Payments				17,905	17,905	16,595	16,595	34,500
Project Administration								
Construct. Inspection				100,000	100,000			100,000
Other				150,000	150,000	13,700	13,700	163,700
Relocation Assistance								
Advisory Services						5,000	5,000	5,000
Subtotal-Admin.				250,000	250,000	18,700	18,700	268,700
Other Costs								
Land Rights				80,630	80,630	104,820	104,820	185,450
TOTAL STRUCTURAL MEASURES				1,802,030	1,802,030	523,240	523,240	2,325,270
TOTAL PROJECT				2,052,030	2,052,030	1,899,670	1,899,670	3,951,700

1/ Price base: 1974

2/ Includes only areas estimated to be adequately treated during the project installation period. Treatment will be accelerated throughout the watershed, and dollar amounts apply to total land areas, not just to adequately treated areas.

3/ Federal agency responsible for assisting in installation of works of improvement.

4/ (M) Manmade ditch or previously modified channel.

TABLE 1A - STATUS OF WATERSHED WORKS OF IMPROVEMENT

Goose Creek Watershed, Washington
(Dollars)

Measures	Unit	Applied to Date	Total 1/ Cost of Improve.
Level Terraces	Mi.	10.5	11,088
Stripcropping	Ac.	270	4,050
Crop Residue Use (3-yr. rotation)	Ac.	1,000	4,000
Chiseling	Ac.	15,000 (annually)	450,000
Grassed Waterways	Mi.	5.0	10,650
Streambank Protection	Mi.	4.0	42,240
Stubble Mulch	Ac.	650 (annually)	14,000
Debris Basins	Ea.	4	2,120
Grade Stabilization Structures	Ea.	2	3,200
Land Needing Grass in the Crop Rotation	Ac.	50.0	1,000
TOTAL			542,348

1/ Price base: 1974

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TABLE 2 - ESTIMATED STRUCTURAL COST DISTRIBUTION

Goose Creek Watershed, Washington

(dollars) 1/

Item	Installation Cost P.L. 566 Funds					Installation Cost - Other				Total Install. Cost	
	Construc.	Engi- neering	Land Rights	Reloc. Pay- ments	Total P.L. 566	Const.	Engi- neering	Land Rights	Reloc. Pay-4/ ments		Total Other
Floodwater Retarding M.P.S.	1,090,765	165,000	69,130	17,905	1,342,800	285,075		2/ 82,260	16,595	383,930	1,726,730
Creston Diversion	62,080	4,000			66,080			9,600		9,600	75,680
Recreational Facilities	91,050	7,000	11,500		109,550	91,050	7,000	3/ 12,500		110,550	220,100
Subtotal	1,243,895	176,000	80,630	17,905	1,518,430	376,125	7,000	104,360	16,595	504,080	2,022,510
Channel Work (M) 5/	30,000	3,600			33,600			460		460	34,060
Subtotal	30,000	3,600			33,600			460		460	34,060
PROJ. ADMIN.	XXX	XXX	XX	XX	250,000	XX	XX	XX	XX	18,700	268,700
GRAND TOTAL	1,273,895	179,600	80,630	17,905	1,802,030	376,125	7,000	104,820	16,595	523,240	2,325,270

1/ Price base: 1974.2/ Includes \$9,250 for surveys, legal fees, and other costs.3/ Includes \$1,000 for surveys, legal fees, and other costs.4/ Relocation payments on three farmsteads.5/ Previously modified channel.

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TABLE 2A - COST ALLOCATION AND COST SHARING SUMMARY

Goose Creek Watershed, Washington

(dollars) 1/

Item	COST ALLOCATION			COST SHARING				
	Purpose		Total	PL-566		Total	Other	
	Flood Preven.	Recre- ation		Flood Preven.	Recre- ation		Flood Preven.	Recre- ation
Creston Diversion	75,680		75,680	66,080		66,080	9,600	
Recreation Facilities		220,100	220,100		109,550	109,550		110,550
Wilbur Channel	34,060	None	34,060	33,600		33,600	460	460
Multipurpose Structures	926,647	800,083	1,726,730	912,800	430,000	1,342,800	13,850	370,080
GRAND TOTAL	1,036,387	1,020,183	2,056,570	1,012,480	539,550	1,552,030	23,910	480,630
								504,540

1/ Price base: 1974.

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TABLE 2B - RECREATIONAL FACILITIES
Estimated Construction Costs
Goose Creek Watershed, Washington

Dollars 1/

Item	Number <u>2/</u>	Estimated Unit Cost	Total Construction Cost
Roads			
1. Lane, Gravel	3,000	3.00/lin. ft.	9,000
2. Lane, Gravel	3,000	5.00/lin. ft.	15,000
Parking Area (Gravel)	20,000	.40/sq.ft. lump	8,000
Playground Equipment		lump	4,500
Tables (Cast Concrete)	40	150.00/ea.	6,000
Fireplaces	30	120.00/ea.	3,600
Rest Room			
(6-unit) vault-showers	1	600 sq. ft. @ \$40/sq. ft.	24,000
(4-unit) vault	2	400 sq. ft. @ \$35/sq. ft.	28,000
Trailer Dump Station	1	lump	2,000
Group Picnic Shelter	1	lump	9,000
Boat Ramp (1-lane)	1	lump	10,000
Boat Dock	1	lump	1,500
Water Dev. Facility	1	lump	4,500
Fence	5,000	1.25/ft.	6,250
Shaping and Planting	10	400/ac.	4,000
Signs	4	lump	1,000
Picnic Shelters	20	500/ea.	10,000
Garbage Containers and Stands	30	50/ea.	1,500
Access Road Improvement		lump	6,000
Power Facilities <u>3/</u>		lump	4,000
Subtotal			158,350
Contingencies			23,750
Total			182,100

1/ 1975 prices.

2/ Estimated quantities subject to change.

3/ Included are the electrical facilities installed, owned, operated and maintained by the sponsors but does not include items whose ownership is retained by a power company.

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TABLE 3 - STRUCTURAL DATA

STRUCTURES WITH PLANNED STORAGE CAPACITY
Goose Creek Watershed, Washington

ITEM	UNIT	Structure Number		
		-1-	-6- <u>1</u> /	-3- <u>2</u> /
Class of Structure		C	C	C
Drainage Area	Sq. Mi.	43	.14	.205
Controlled	Sq. Mi.	43	.14	.205
Curve No. (1-day) (AMC 11)		87	87	87
Tc	Hrs.	9	.3	.4
Elevation Top of Fill	Ft.	2238.0	2462.8	2468.4
Elevation Crest Emergency Spillway	Ft.	2228.0	2459.8	2466.4
Elevation Crest High Stage Inlet	Ft.	2218.5	2459.2	2465.2
Elevation Crest Low Stage Inlet	Ft.	2214.5	2449.0	2458.0
Maximum Height of Fill	Ft.	58	12.8	13.0
Volume of Fill	Cu. Yds.	358,556	3860	3075
Total Capacity	Ac. Ft.	6800	15.8	20.0
Sediment Submerged 1st 50 years	Ac. Ft.	525	-	-
Sediment Submerged 2nd 50 years	Ac. Ft.	507	-	-
Sediment Aerated	Ac. Ft.	92	13.8	15.6
Recreation Use	Ac. Ft.	2226	-	-
Retarding	Ac. Ft.	3450	2.	4.4
Between high and low stage	Ac. Ft.	1000	13.8	15.6
Surface Area				
Sediment pool	Acres	142	2.6	4.3
Recreation pool (maximum)	Acres	235	-	-
Retarding pool	Acres	300	2.9	4.8
Principal Spillway				
Rainfall Volume (areal) (1-day)	In.	2.15	2.15	2.15
Rainfall Volume (areal) (10-day)	In.	4.82	4.82	4.82
Runoff Volume (10-day)	Inc.	3.4	3.4	3.4
Capacity of Low Stage (Max.)	Cfs.	30	15	15
Capacity of High Stage (Max.)	Cfs.	318	18	82
Frequency operation - Emerg. Spillway	% chance	1	1	1
Size of Conduit	Dim.	48"	15"	30"
Emergency Spillway				
Rainfall Volume (ESH) (areal) 6 hour	In.	3.2	2.9	2.9
Runoff Volume (ESH)	In.	1.87	1.29	1.29
Type		Rock	Earth	Earth
Bottom Width	Ft.	175	36	21
Velocity of flow (V_e)	Ft./Sec.	7.0	<u>3</u> /	<u>3</u> /
Slope of exit channel	Ft./Ft.	.034	.02	.02
Maximum water surface elevation	Ft.	2230.6	<u>3</u> /	<u>3</u> /
Freeboard				
Rainfall Volume (FH) (areal)	In.	8.1	7.2	7.2
Runoff Volume (FH)	In.	5.84	5.0	5.0
Maximum water surface elevation	Ft.	2237.0	2461.8	2468.4
Capacity Equivalents				
Sediment Volume	In.	.49	1.85	1.43
Retarding Volume	In.	1.50	.27	.40

1/ East draw at Creston2/ West draw at Creston3/ No flow in Emerg. Spillway for ESH

November 1975

TABLE 3A - STRUCTURAL DATA

CHANNELS

Goose Creek Watershed, Washington

Channel (No. or Name)	Station or Reach	Drain- age Area Sq. Mi.	Capacity (cfs)		Hy- draulic Grad. (ft/ft)	Channel Dimensions 1/			Aged "n" Value	As Built		2/ Type of Work	Before Project	
			Req'd	Design		Av. X- Section Area (ft ²)	Wetted perim- eter	Depth of flow (ft)		"n" Value	Veloc- ity (fps)		Type of 2/ Channel	Flow 4/ Condition
Goose Creek	131+50 to 139+00	59	1,720	1,720	.004	200	4.0	8.0	.03	.025	8.6	11	M (1960)	Pr

Channel (No. or Name)	Station or Reach	Drain- age Area Sq. Mi.	Capacity (cfs)		Hy- draulic Grad. (ft/ft)	Channel Dimensions				Aged "n" Value	As Built		2/ Type of Work	Before Project	
			Req'd	Design		Bottom Width (ft)	Slope (ft/ft)	Depth of flow (ft)	Side Slopes		"n" Value	Veloc- ity (fps)		Type of 2/ Channel	Flow 4/ Condition
Creston North	100+00 to 122+09	.26	59	70	.002	8	.002	2	4:1	.035	.025	2.5	1	0	E
North	0+00 to 5+97	.26	59	70	.001	8	.002	2	4:1	.035	.025	2.5	1	0	E
Main	120+00 to 142+93	.52	100	100	.002	12	.002	2	4:1	.035	.025	2.3	1	0	E
South	100+00 to 120+00	.26	59	70	.002	8	.002	2	4:1	.035	.025	2.5	1	0	E

1/ Where excavation is not planned, cross sectional area and wetted perimeter below hydraulic grade line are shown.

2/ 1 - Establishment of new channel including necessary stabilization measures.

11 - Enlargement or realignment of existing channel or stream.

2/ M - Manmade ditch or previously modified channel (approximate date of last major construction in parenthesis)

0 - None or practically no defined channel.

4/ Pr - Perennial - flows at all times except during extreme drought.

E - Ephemeral - flows only during periods of surface run-off, otherwise dry.

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TABLE 4 - ANNUAL COST

Goose Creek Watershed, Washington

(dollars) 1/

Evaluation Unit	Amortization of Installation Cost <u>2/</u>	Operation and Maintenance Cost	Total
Creston Diversion	4,650	750	5,400
All other Structural Measures	121,640	27,770 <u>3/</u>	149,410
Project Administration	16,500		16,500
GRAND TOTAL	142,790	28,520	171,310

1/ Price base: 1974

2/ 100 years @ 6-1/8 percent interest.

3/ Includes \$13,625 for operation, maintenance, and replacement for the recreational development, and \$7,120 for expenses for lake rehabilitation and restocking of fish.

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Table 5 - ESTIMATED AVERAGE ANNUAL FLOOD DAMAGE REDUCTION BENEFITS

Goose Creek Watershed, Washington

(dollars) 1/

Item	Estimated Avg. Annual Damage		Damage Reduction Benefit <u>2/</u>
	Without Project	With Project	
Floodwater and Sediment Wilbur			
Residential	31,560	0	31,560
Public and Commercial	84,970	0	84,970
Streets, bridges, and railroad	15,000	0	15,000
Creston	15,400	0	15,400
Indirect	15,070	0	15,070
TOTAL	162,000		162,000

1/ Price base: 1974

2/ Damages and benefits will accrue from floods of greater magnitude than 1 percent frequency, but were not evaluated.

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TABLE 6 - COMPARISON OF BENEFITS AND COSTS FOR STRUCTURAL MEASURES

Goose Creek Watershed, Washington

(dollars)

Evaluation Unit	Average Annual Benefits <u>1/</u>				Average Annual <u>3/</u> Cost	Benefit Cost Ratio
	Damage Reduction	Recreation	Secondary	Total		
Creston Diversion	16,870		1,450	18,320	5,400	3.4
All other Structural Measures	145,130	187,100	8,250	340,480	149,410	2.3:1
Project Admin.					16,500	
GRAND TOTAL	<u>2/</u> 162,000	187,100	9,700	358,800	171,310	2.1:1

1/ Price base: 1974

2/ Land treatment measures will not provide measurable flood damage reduction benefits.

3/ From Table 4.

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PRINCIPLES AND STANDARDS PHASE-IN ADDENDUM
September 1975

PLAN
Goose Creek Watershed

Lincoln County
Washington

CONTENTS

Introduction

Part 1 - Discount rate comparison.

Part 2 - Display of impacts to national economic development, environmental quality, regional development and social well-being accounts.

Part 3 - Display of the abbreviated environmental quality alternative.

INTRODUCTION

This addendum is based on procedures established for application of the Water Resources Council's Principles and Standards to implementation studies in process.

The Goose Creek Watershed plan was developed using 1974 installation costs, a 6-1/8 percent discount rate, current prices for values other than agriculture products, and current recreational values in the evaluation of the project structural measures.

Part 1 of this addendum shows the effect of evaluating the structural measures using current installation costs and the current discount rate.

Part 2 of the addendum displays the effects of the selected plan as evaluated for each of the separate accounts--national economic development, environmental quality, regional development, and social well-being. Values for costs, prices, and rates are those of the plan.

Part 3 of the addendum displays an abbreviated alternative plan developed to emphasize environmental quality presented for comparison only with the selected plan. Bases for costs, prices and rates are those of the selected plan.

DISCOUNT RATE COMPARISON

The plan shows an evaluation of the project structural measures using 1974 installation costs and a discount rate of 6-1/8 percent.

This addendum shows the project costs, benefits, and benefit-cost ration based on 6-1/8 percent interest rate, 1976 installation costs, and current normalized prices for agricultural commodities. Annual project costs, benefits and benefit-cost ratio are as follows:

1. Project costs are \$192,500.
2. Project benefits are \$358,800.
3. The project benefit-cost ratio is 1.9:1.
4. Project benefits without secondary benefits are \$349,100.
5. The project benefit-cost ration without secondary benefits is 1.8:1.

SELECTED PLAN
NATIONAL ECONOMIC DEVELOPMENT ACCOUNT
Goose Creek Watershed, Washington

Components	Measures of Effects ^{1/} (Dollars)	Components	Measures of Effects ^{1/} (Dollars)
Beneficial Effects:			
A. The value to users of increased outputs of goods and services		A. The value of resources required for the plan	
1. Flood prevention	162,000	1. Floodwater retarding, recreation facilities and diversion structures	126,290
2. Recreation	187,100		16,500
Total beneficial effects	349,100	Project installation Project administration OM&R	28,520
		Total adverse effects	171,310
		Net beneficial effects	177,790
1/ Average annual			

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SELECTED PLAN
ENVIRONMENTAL QUALITY ACCOUNT
Goose Creek Watershed, Washington

<u>Components</u>	<u>Measures of Effects</u>
Beneficial and adverse effects:	1. Planned elements improve the aesthetic appearance of general landscape.
A. Areas of natural beauty	2. Aesthetics of the area improved by the land treatment measures and the 235 acre reservoir.
B. Quality considerations of water, land, and air resources	1. A slight reduction of flood runoff peaks due to land treatment.
	2. An increase in ground infiltration of moisture.
	3. A 30 percent decrease in average annual erosion rates and a 73 percent decrease in sediment yield, with a corresponding reduction in chemical fertilizer levels in runoff water.
	4. Sediment deposition reduced on 50 acres of cropland and 8 acres of pastureland.
	5. Less sediment and flooding in downstream watershed areas.
	6. One hundred and fourteen acres of land set aside for recreation development at the reservoir site.
	7. Opportunity for 55,100 annual recreation visits to the reservoir and facilities.
	8. Water quality downstream of the reservoir improved by reducing coliform counts and turbidity.
	9. Approximately 158 acres, including 209 buildings protected from flooding in Wilbur.

SELECTED PLAN
ENVIRONMENTAL QUALITY ACCOUNT
Goose Creek Watershed, Washington

<u>Components</u>	<u>Measures of Effects</u>
Beneficial and adverse effects:	10. Approximately 78 acres, including 30 buildings, protected from flooding in Creston.
B. Quality considerations of water, land, and air resources	11. Limited noise pollution from motor-boating on the lake. 12. Noise and air pollution associated with the project construction activities. 13. 1,000 acre feet evaporation with 3-4 feet drawdown of reservoir. 14. Small archeological site may be disturbed by influx of people into the area.
C. Biological resources and selected ecosystems	1. Improved habitat on approximately 45 acres because of grassed waterways and terraces. 2. Approximately 90,000 trout harvested annually and 14,520 fisherman days. 3. Nesting area for approximately 2,100 ducks and geese annually. 4. Approximately 5.75 miles of riparian habitat created by the reservoir shoreline. 5. Approximately 279 acres of wildlife habitat lost with multipurpose reservoir installation. 6. Approximately 2.1 miles of intermittent stream channel inundated by the reservoir. 7. Elimination of nesting and brood habitat for 30-50 ducks. 8. Wildlife disturbed in the 114 acre recreation area.

SELECTED PLAN

ENVIRONMENTAL QUALITY ACCOUNT Goose Creek Watershed, Washington

<u>Components</u>	<u>Measures of effects</u>
C. Biological resources and selected ecosystems	<p>9. 500 waterfowl harvested annually and about 600 hunter days generated.</p> <p>10. A positive effect on wetland and some flowing sections of the creek by diversion of water into Sinking Creek.</p>
D. Irreversible or irretrievable commitment	<p>1. The major irreversible and irretrievable land commitment is the land associated with the dam and recreation facility. Of the 480 acres to be permanently committed to the project, 100 are pasture and haylands, 15.1 are wetlands, and 364.9 are rangelands. After project completion: 279 acres committed to the dam and the recreation pool; 87 additional acres to the flood pool, and 114 acres to the recreational facility.</p> <p>Removal of the impounded water would allow the land (reservoir bottom) to be reclaimed for a usage similar to what now exists. Only the 45 acres under the dam would remain unavailable to feasible reclamation.</p> <p>2. Permanent land rights area (37 acres) for the Wilbur channel and Creston Project committed for the life of the project.</p> <p>3. Labor, fuel for construction equipment, federal, state, and local dollars, local natural materials, and various man-made products committed to the numerous aspects of the project.</p>

SELECTED PLAN

REGIONAL DEVELOPMENT ACCOUNT Goose Creek Watershed, Washington

<u>Components</u>		<u>Measures of Effects</u> ^{1/}		<u>Measures of Effects</u> ^{1/}			
<u>Income:</u>	<u>State of WA</u>	<u>Rest of Nation</u>	<u>Dollars</u>	<u>State of WA</u>	<u>Rest of Nation</u>		
						<u>Income:</u>	<u>Components</u>
<u>Beneficial Effects:</u>							
A.	The value of increased output of goods and services to users residing in the region			A. The value of resources contributed from within the region to achieve the outputs			
1.	Flood Prevention		162,000	0	1.	Floodwater retarding, recreation facilities, and diversion structures	
2.	Recreation		187,100	0			
B.	The value of output to users residing in the region from external economies				Project installation	27,740	
					Project administration	1,160	
					OM&R	28,520	
1.	Induced by and stemming from effects		9,700	0	Total Adverse Effects	57,420	
						110,060	
Total	Beneficial Effects		358,800	0	Net Beneficial Effects	301,380	
						-110,060	

1/ Average annual

September 1975

SELECTED PLAN

REGIONAL DEVELOPMENT ACCOUNT
Goose Creek Watershed, Washington

<u>Components</u>		<u>Measures of Effects</u>		<u>Components</u>		<u>Measures of Effects</u>	
		<u>State of</u>	<u>Rest of</u>			<u>State of</u>	<u>Rest of</u>
		<u>Washington</u>	<u>Nation</u>			<u>Washington</u>	<u>Nation</u>
Beneficial effects:				Adverse effects:			
C. Employment				C. Employment			
1. Increase in number and types of jobs		1. Decrease in number and types of jobs				0 0	
a. Employment for project construction		1.9 man-years (m/y) semiskilled labor		Total adverse effects		0 0	
		10.4 m/y skilled		Net beneficial effects		26.9 m/y semiskilled labor	
b. Employment for project OM&R		2.0 m/y semiskilled labor annually				10.4 m/y skilled labor	
						2.0 m/y semiskilled labor annually	
c. Employment in land treatment construction over a ten year period		25.0 m/y semiskilled labor				5.0 m/y unskilled labor annually	
						5.0 m/y unskilled labor annually	
d. Employment in service and trade activities induced by and stemming from project operation		5.0 m/y unskilled labor annually					
Total beneficial effects		26.9 m/y semiskilled labor					
		10.4 m/y skilled labor					
		2.0 m/y semiskilled labor annually					
		5.0 m/y unskilled labor annually					

September 1975

SELECTED PLAN
REGIONAL DEVELOPMENT ACCOUNT (Continued)
Goose Creek Watershed, Washington

<u>Components</u>	<u>Measure of effects</u>	
	<u>State of Washington</u>	<u>Rest of Nation</u>
Regional Economic Base and Stability		
Beneficial effects:	The project will provide one percent protection to the towns of Wilbur and Creston. Property is assessed at over \$5,000,000 within the flood-plains. Recreation will bring needed revenues into the area, providing 5 man-years of unskilled jobs to the community, annually.	0
Adverse effects:	The added recreational visitors will extend the public services of the area. The recreationist will be a nuisance to some residents.	0

September 1975

SELECTED PLAN

SOCIAL WELL-BEING ACCOUNT
Goose Creek Watershed, Washington

Components

Beneficial and adverse effects:

A. Real Income Distribution

Measures of Effects

1. Create 26.9 m/y semiskilled and 10.4 m/y skilled labor.
Create 2 m/y semiskilled and 5 m/y unskilled labor, annually.
2. Create regional 1/ income distribution of \$358,800 flood damage reduction benefits and recreation benefits by income class as follows:

Income Class (Dollars)	Percentage of Adjusted	
	Gross Income in Class	Benefits in Class
Less than 3,999	2	25
4,000-11,999	40	50
More than 12,000	58	25

1/ The realization of the \$162,000 flood damage reduction benefits is considered to occur in the towns of Creston and Wilbur. Secondary benefits of \$9,700 and \$187,100 of recreation benefits will occur within the State of Washington for the most part.

September 1975

SELECTED PLAN

SOCIAL WELL-BEING ACCOUNT (Continued)
Goose Creek Watershed, Washington

Components

Beneficial and adverse effects:

A. Real Income Distribution
(continued)

3. Local cost to be borne by region, total \$523,240.

Measures of Effects

<u>Income Class</u> (Dollars)	<u>Percentage of Adjusted Gross Income in Class</u>	<u>Percentage of Contri- butions in Class</u>
Less than 3,999	2	3
4,000-11,999	40	33
More than 12,000	58	64

B. Life, health and safety

1. Provide 1-percent level of flood protection to 239 homes and businesses in Wilbur and Creston. This amounts to 236 acres. Future threats of loss of life and displacements during floods will be eliminated. Needed recreational opportunities will be afforded residents and visitors to the area.

C. Educational, cultural,
and recreational

1. Provide opportunity for 39,980 general recreation visits, 14,520 fisherman days, and about 600 hunter days.

September 1975

ENVIRONMENTAL QUALITY PLAN
Goose Creek Watershed

Component	Watershed Problems
A. Areas of Natural Beauty	<ol style="list-style-type: none">1. Flooding of agricultural and urban areas leaves debris in and along stream channels and in the communities of Wilbur and Creston.2. The domination by wheat and rangeland creates an unvarying landscape.3. Buildings too close to channel banks within Wilbur.4. Stream has been channelized from the east side of Wilbur to one mile below Wilbur, thus eliminating natural diversity.
B. Quality Considerations, Water, Land, Air, and Social Resources	<ol style="list-style-type: none">1. Erosion and Sedimentation: Sheet, rill, and gully erosion are occurring within the watershed. The severity of the erosion and eventual sediment deposits depend upon soil conditions and amount of precipitation that falls.2. Water Quantity and Quality: Deposition of sediments along and within the streams, as well as streambank erosion, reduce natural habitat and water quality. During summer months, flow is intermittent in many stretches of the stream. High coliform counts occur in Goose Creek.3. Lack of recreational opportunities within the area.
C. Biological Resources and Selected Ecosystems	<ol style="list-style-type: none">1. Fisheries: Flows are intermittent in many stream reaches. Streambanks have been denuded of vegetation which increases the stream temperature.2. Wildlife: Only minor habitat exists for wildlife within the wheat-fallow sections of the watershed. Most of the wetland potholes have dried up by fall and offer no rest areas for migratory waterfowl.3. Vector Control: Spring flooding produces many wet areas along the stream channel which are conducive to mosquito breeding. The type III wetland located east of Creston also produces a mosquito problem in the area.

ENVIRONMENTAL QUALITY PLAN

Goose Creek Watershed

Component Needs	Plan Elements
1. Community land use zoning and flood plain management, including application to H. U. D. for flood insurance	1. Provide technical assistance and cost sharing to implement effective land treatment program throughout the watershed, (land treatment measures such as, strip-cropping, terraces, diversions, treeplantings, seeding critical areas). Approximate cost \$1,626,430.
2. Visual diversity to the landscape	2. Construct and maintain a multiple-purpose reservoir which would (1) prevent flooding within the community of Wilbur; (2) provide 235 acre recreation and fishery pool; (3) provide for migratory waterfowl resting areas; (4) provide an aesthetic quality to the landscape. Approximate cost \$1,900,000.
3. Flood control	3. Construct and maintain a multiple-purpose structure east of Creston providing flood protection and wildlife habitat. Approximate cost \$70,000.
4. Reduce the amount of erosion which occurs on the land	4. Construct and maintain velocity control structure through the community of Wilbur, thus providing additional water areas for fish. Approximate cost for these, \$80,000.
5. Provide food and cover for wildlife species	5. Plant and maintain 2 percent of the watershed cropland to wildlife habitat. <ul style="list-style-type: none"> a. Along denuded streambank b. High erosion areas c. Reservoir area between emergency and principal spillways d. Other areas as needed
6. Provide recreation within the watershed	Establish wildlife watering facilities at a rate of one per square mile. Approximate cost \$140,000.
	6. Land use regulations and zoning. County-wide land use regulations would need to be passed by the County Commission. Such zoning laws could provide that all building be approved by the County Planning Committee.

ENVIRONMENTAL QUALITY PLAN

Goose Creek Watershed

Environmental Impacts

1. Eighty-eight acres would be converted to grassland.
2. Improved cover and habitat for small animals and birds on 23,000 acres.
3. Decrease in average annual erosion rates by 30 percent and sediment yield by 73 percent.
4. Reduction of peak runoff for the 100-year event at Wilbur by 78 percent with resulting reductions in stream aggradation and degradation.
5. Increase in ground absorption rates of moisture.
6. Planned elements would improve the aesthetic appearance of general landscape.
7. Five and three fourths miles of riparian habitat for wildlife.
8. A 235 acre lake created by the dam.
9. With proper management, 90,000 trout harvested annually, resulting in 14,520 fisherman days.
10. Resting area for 2,100 ducks and geese on reservoir area.
11. Eliminate flooding of 209 buildings in Wilbur from 1 percent runoff event.
12. Visual aesthetics of the Wilbur channel improved.
13. Change the land use of 100 acres of pasture and haylands and 15.1 acres of wetlands, and 364.9 acres rangeland to recreation land.
14. Approximately 2.1 miles of intermittent stream channel lost due to reservoir formation.
15. Nesting habitat of up to 30-50 ducks along the existing stream system lost due to reservoir formation.
16. Approximately 279 acres of wildlife habitat lost.
17. Additional local taxes required for project construction.
18. A limited quantity of dust from construction entering atmosphere.
19. Construction, future motor-boating, and recreation-generated traffic would create noise.

20. Three farmsteads and approximately seven persons relocated.
21. Productivity on 40 acres of cropland reduced by disturbance in the borrow area.
22. High coliform levels in Goose Creek below the reservoir decreased after impoundment.
23. Opportunity for 55,100 annual recreation visits provided by reservoir and recreation facilities.
24. Supplemented streamflow and wetlands of Sinking Creek (35 acre feet).
25. Flooding of Creston alleviated, thus protecting 30 homes and businesses from 1-percent event.
26. Construction-oriented monies spent in the region, thereby temporarily bolstering various segments of the economy.
27. Twenty-six and nine tenths man-years of semiskilled and 10.4 man-years of skilled labor provided by project construction.
28. Provide 2 man-years of semiskilled labor annually for operation, maintenance and repair.
29. There would be 5 man-years of unskilled employment, annually, in services and trades.
30. Conservation farming would maintain the soil resource and increase the level of soil moisture.
31. Diversity of recreation opportunities for all ages.
32. Water flow to Goose Creek reduced by 35 AF (average annual).
33. Six hundred fifty acres of wildlife plantings within the cropland area.
34. Annual evaporation of 900 to 1,000 AF from the reservoir.
35. Small archeological site in vicinity of multipurpose reservoir may be disturbed by an influx of people into the area.

Irreversible and Irretrievable Commitments of Resources

The major irreversible and irretrievable commitment of land would be that associated with the dam and recreation facility. Of the 480 acres which would be permanently committed to the project, 100 are pasture and haylands, 15.1 are wetlands, and 364.9 are rangelands. After project completion, 279 acres would be committed to the dam and the recreation pool; 67 acres to the flood-pool, 20 acres to area above emergency spilling crest, and 114 acres to the recreational facility.

Removal of the impounded water would allow the land (reservoir bottom) to be reclaimed for a usage similar to what now exists. Only the 45 acres under the dam would remain unavailable to feasible reclamation.

The permanent land rights areas (37 acres) for the Wilbur channel and the Creston project would be committed for the life of the project.

Labor, fuel for construction equipment, federal, state, and local dollars, local natural materials, and various man-made products would all be committed to the numerous aspects of the project.

USDA-SCS-EIS-WS-(ADM)-75-1 -F-WA.

GOOSE CREEK WATERSHED PROJECT
LINCOLN COUNTY, WASHINGTON

FINAL ENVIRONMENTAL IMPACT STATEMENT

Galen S. Bridge
State Conservationist
Soil Conservation Service

SPONSORING LOCAL ORGANIZATIONS

TOWN OF WILBUR
Wilbur, Washington 99185

LINCOLN COUNTY CONSERVATION DISTRICT
Davenport, Washington 99122

TOWN OF CRESTON
Creston, Washington 99117

April 1976

PREPARED BY

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
360 U.S. Courthouse
Spokane, Washington 99201

USDA ENVIRONMENTAL IMPACT STATEMENT
Goose Creek Watershed Project
Lincoln County
State of Washington

Prepared in accordance with sec. 102 (2) (C) of P.L. 91-190.

II. SUMMARY

- A. Final
- B. Soil Conservation Service
- C. Administrative
- D. Brief description of project purpose and action: A project for watershed protection, flood prevention, and recreation in Lincoln County, Washington, to be implemented under authority of the Watershed Protection and Flood Prevention Act (P.L. 566, 83d Congress, 68 Stat. 666), as amended. The planned project consists of conservation land treatment plus a multipurpose flood control and recreation structure and recreation facilities, work on approximately 750 feet of channel through the town of Wilbur, and minor flood control structures and diversion channels for the town of Creston.
- E. Summary of environmental impacts including adverse and favorable environmental effects: Land use will be altered on 465 acres; 10.5 acres of wetland will be eliminated with the creation of a 235-acre reservoir; flooding will be reduced on 236 acres in Wilbur and Creston, including 239 buildings; annual erosion rates will be reduced by 30 percent and sediment yield by 73 percent; sediment deposition will be reduced on 58 acres; the reservoir and facilities will account for a catch of 90,000 trout annually, provide a resting area for about 2,100 ducks and geese annually, and provide 55,100 annual recreation visits; water quality will be improved; shoreline habitat of 5.75 miles will be created and 2.1 miles of intermittent stream will be inundated; 900-1,000 AF of runoff will be unavailable for previous downstream uses; three farmsteads and seven persons will be forced to relocate; temporary labor opportunity of 37.3 man-years and annual need for 7 man-years will be created; construction activities will create noise and air pollution; aesthetics and social well-being of the area will be improved; and problems such as litter and traffic will be generated by the recreation development.

F. List of alternatives: (a) accelerated land treatment only; (b) accelerated land treatment, planned project for Creston, and non-structural measures for Wilbur; (c) accelerated land treatment, approximately 250 small dams, and planned project for Creston; (d) accelerated land treatment, four dams and planned project for Creston; (e) accelerated land treatment, planned multipurpose structure, one additional structure, and planned project for Creston; (f) no project with continuing land treatment program.

G. Written comments have been received from:

U.S. Department of the Interior
U.S. Department of Transportation
Environmental Protection Agency
Advisory Council on Historic Preservation
Washington State Department of Ecology
Office of Community Development (State Clearinghouse)
Washington Department of Game
Washington State Highway Commission
Washington State Parks and Recreation Commission
Grant, Lincoln, Adams County, Conference of Governments
Friends of the Earth, Inc.
U.S. Department of the Army.

H. Draft statement transmitted to CEQ on December 12, 1975.

III. PROJECT IDENTIFICATION

AND

ENVIRONMENTAL SETTING

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
FINAL ENVIRONMENTAL IMPACT STATEMENT^{1/}

for

A. Goose Creek Watershed, Washington

Installation of this project constitutes an administrative action. Federal assistance will be provided under the authority of Public Law 83-566, 83d Congress, 68 Stat. 666, as amended.

B. Sponsoring Local Organizations

Lincoln County Conservation District

Town of Wilbur

Town of Creston

^{1/} All information and data except as otherwise noted were collected by the SCS and Forest Service, USDA.

C. Project Purposes and Goals

The Columbia-North Pacific Comprehensive Framework Study states that Goose Creek Watershed needs cooperative watershed development by 1980. Specific types of development needed are flood protection and land treatment.

The project sponsors, the public, and the Soil Conservation Service have set forth the following project purposes and goals:

Reduction of Flooding

To achieve flood protection from the 1 percent storm event by regulating the flow in the channels through the towns of Wilbur and Creston.

Recreation

To provide water based recreation with basic facilities for boating, fishing, picnicking, and camping.

Conservation Land Treatment

To provide a level of land treatment that will allow maximum production while conserving and enhancing the natural resource base.

Hold erosion rates within acceptable limits for the site classification. Average annual soil loss on the croplands should not exceed 5 tons/acre on very deep soils and 2 tons/acre on shallow soils.

Accelerate efforts of the Lincoln County Conservation District and other agencies to provide increased technical and financial assistance to watershed farmers to apply 75 percent of the needed land treatment measures during the installation period.

D. PLANNED PROJECT

Land Treatment Measures

An assessment of needed conservation land treatment for the watershed has been developed. This has been executed with the cooperation of the Board of Supervisors of the Lincoln County Conservation District.

The Board of Supervisors for the Conservation District are encouraging more cooperative agreements and better conservation plans. District equipment and machinery is rented to farmers and ranchers for the installation of conservation measures. A District laboratory provides facilities for testing soils.

Land treatment measures are installed by the landowners. It is a voluntary action taken by individual farmers and ranchers with technical assistance provided by SCS. These measures will be used in different combinations in developing a conservation plan for each cooperating landowner, in accordance with the technical guide for the area, to keep soil loss within acceptable limits.

The United States Department of Agriculture has cost sharing programs, administered by the Agricultural Stabilization and Conservation Service, whereby financial assistance is available to landowners and operators for the application of conservation practices for land treatment.

About 13,500 acres of cropland require establishment of or improvement of a stubble-mulch program. Other conservation measures which are to be installed include chiseling, and stripcropping, or divided slope farming. Small structural measures include debris basins, grade stabilization structures, gradient terraces, level terraces, and grass waterways. About 900 acres of cropland need grass in the rotation, or a land use conversion to permanent grass. About 14,000 acres of cropland would benefit from a 3-year rotation of wheat, barley, fallow in higher moisture zones. About 3,000 acres of rangeland require the establishment of proper grazing use and deferred grazing.

It is anticipated that 75 percent of the needed conservation land treatment will be implemented during the 10-year installation period.

Structural Measures 1/

(Multipurpose Structure and Recreation Facilities) 2/

An earth and rock fill dam 58 feet high and 1,600 feet long, with a maximum recreational reservoir area of 235 acres will be built. The reservoir will be located 1 mile east of Wilbur on Goose Creek. The planned features of the Goose Creek dam and reservoir include the dam,

1/ See project map

2/ See drawing, sheets 3 & 4, Appendix H

emergency spillway, the borrow areas, the areas of the flood pool, recreation pool and recreational facilities.

The embankment will be constructed using a zoned fill. Rock for blanketing the core will be obtained from the emergency spillway excavation and from the borrow pits above the dam. Filter material to be used between core and rock will be manufactured from local pits.

The borrow material for the center or core section of the embankment lies about 1,000 feet north of the damsite. A relatively thin mantle of loess, consisting of nonplastic to slightly plastic silts (ML), overlies the area. The maximum thickness of the wind-deposited sediments is 11.0 feet, with an average thickness of 5.0 feet. The borrow material is underlain either by dense caliche beds, or basalt rock. Therefore, about 30 acres of borrow will be necessary to furnish the required 149,000 cubic yards of material. The area will be stripped of topsoil which will then be stockpiled adjacent to the site. After construction, topsoil will be used for the final regrading of the site, before resumption of farming. A 40-acre construction easement will be obtained and a maximum of 240,000 cubic yards will be available. This includes a trucking right-of-way south to the damsite. The access road will be properly prepared and seeded after construction.

A second borrow area will be located about 200 feet east of the dam centerline. About 165,000 cubic yards of rock will be removed from this borrow area. The area presently consists of rangeland with very little soil over basalt bedrock. Presplitting of the borrow material will be done prior to dental grouting of the core area of the fill. After construction this area will be covered with water.

Foundation materials consist of basalt rock except for about a 200-foot width of valley where lacustrine and alluvial sediments have been deposited. These deposits have a maximum thickness of 25 feet and consist predominantly of peat and plastic to nonplastic silts. A 5-foot basal deposit of basalt gravels and cobbles overlies the basalt bedrock. Surface outcrops indicate that the basalt flows are flat-lying and are generally dense, with tight, vertical cooling joints that trend in a northwest to southeast direction.

The unconsolidated foundation materials have little bearing strength and a high consolidation potential. These soils will need to be removed from the foundation. It will require 32,000 cubic yards of excavation to remove this material from the entire base width of the dam. Part of the replacement material will be obtained from the wind-deposited silts that mantle the uplands north of the damsite.

Principal and emergency spillways will be founded on stable bedrock. Pre-splitting of the rock for excavation of the emergency spillway will reduce shock and control breakage in the rock.

Construction of the emergency spillway will be around the north end of the fill. The bottom width of 175 feet will provide capacity to pass the emergency spillway storm and remain stable.

The multiple-purpose reservoir is designed for a 100-year life. It will have capacity for 1,124 acre-feet of sediment, the estimated deposition over the next 100 years, 2,226 acre-feet of firm storage for recreation, and 3,450 acre-feet of floodwater capacity for retarding the estimated runoff from a 1-percent-chance storm. One thousand acre-feet of the floodwater capacity will be used to store water for recreation, in addition to that in the permanent pool, between March 15 and November 1 each year. The total floodwater capacity of 3,450 acre-feet will be available for the flood prevention purpose between November 1 and March 15.

Sediment capacity within the reservoir is that occupied by sediment below the crest of the emergency spillway.

The concrete riser for the principal spillway will consist of a two stage inlet. A gated inlet will be provided at the top of the single-purpose recreation pool, and an open inlet at the top of the joint use pool. The conduit under the fill will be a 48-inch reinforced concrete pipe with a concrete cradle outletting through an impact basin. Runoff from approximately 67 percent (43 square miles) of the watershed will be controlled by the structure.

All buildings, fences, trees, and large bushes will be cleared from the reservoir's recreation pool acreage.

A stream gage will be maintained in the city park to measure the outflow below the dam. Another stream gage, installed upstream from the recreation pool, will be installed to measure inflow for purposes of maintaining base flows downstream. The gages will be installed under provisions of Bureau of Budget Circular A-67. The circular sets up procedures for hydrometeorological instrumentation by federal agencies to prevent duplication of effort.

The recreation pool will be about 2 miles long and average .25 mile wide from the dam upstream 1.5 miles. The width of the upper end of the reservoir will taper to 10 feet at the mouth of Goose Creek. New shoreline created will be 5.75 miles. The reservoir will be the vehicle for numerous recreation activities. Certain activities are readily associated with the lake, including fishing, boating, sailing, and duck hunting. It is estimated that the reservoir and facilities will account for 14,520 angler days with an annual catch of 90,000 trout.

The recreational facilities will be established on the south shore of the lake, between the water and U.S. Route 2, approximately two-thirds of a mile east of the dam.

The lake, recreation facilities, and land adjacent to the lake will be available to the public with access through the recreation area. The recreation facilities will include all weather gravel access and interior roads, 25 campsites, with adequate overflow area, 40 concrete picnic tables, with group shelter, a water supply, vault sanitation facilities, and a one-lane boat launching ramp, with associated car-trailer parking. Provisions for the physically handicapped are to be designed into the facilities.

The facilities will be under the jurisdiction of the Lincoln County Health Department. This will bring about certain controls and safeguards, generally aimed at protecting and insuring the general health, safety, and welfare of the populace.

Lands required are those necessary for the construction and occupancy of project structural measures, and for the storage of water for flood prevention and recreational purposes. Type of land rights necessary and present land use are broken down on page II-9.

After project completion, 480 of the 520 acres will be available for public use, and 40 acres of borrow will revert to private ownership.

Relocation of three farmsteads will result because of the construction of the dam and reservoir. Presently, one farmstead is unoccupied and two are under lease. On the basis of current occupants, seven persons will be displaced. In addition to outright purchase of the land and improvements, either through negotiation or by the use of eminent domain, relocation costs and moving assistance to those displaced will be made available. None of the persons are considered low income or minority persons.

Debris basins in the borrow areas will minimize runoff problems, if any. Construction of the dam will be done during low flow so that water pollution will be kept to a minimum. A coffer dam will be built upstream from the dam to hold runoff water for construction uses. Air and noise pollution from construction equipment will be minimized, as all equipment used will meet state and national occupation safety and health acts standards. Additionally, the site is sufficiently isolated so as not to present a nuisance image to local residents. Blasting to be done in the emergency spillway and rock borrow area will be carefully controlled and monitored.

Land Use and Type of Land Rights for
Multipurpose Structure and Recreation Facilities

DESCRIPTION	LAND USE - ACRES				TYPE LAND RIGHTS - ACRES	
	PASTURE & HAYLAND	WETLANDS	RANGE LANDS	CROP LANDS	TOTAL:	FEE TITLE
Embankment and recreation pool	95	10.5	173.5	---	279	279
Floodpool (above recreation pool)	5	4.6	57.4	---	67	67
Land Recreation facility	---	---	114	---	114	114
Borrow areas	---	---	---	40	40	40
Other	---	---	20	---	20	20
TOTAL	100	15.1	364.9	40	520	480

(Wilbur Channel Work) 1/

Channel work will be done through the town of Wilbur on Goose Creek. Work will consist of providing a minimum cross-sectional area to pass the 1 percent (1,720 cfs) runoff event from Lauritzen Draw, Railroad Draw, and discharge from the reservoir.

The stream channel through Wilbur has been modified and enlarged in the past. Soils which form the channel are predominantly silt loam, with inclusions of basalt rock outcrops. Much of the bottom is armored with basalt rock fragment 6-12 inches in size.

Channel work will be limited to removing a rock ledge from approximately 0.1 mile of channel within the community of Wilbur. Riprap will be applied to the areas where vegetation is removed from the streambanks. Public access to the Goose Creek channel is provided at the city park located in the center of Wilbur. The work will require permanent land-rights of approximately 1 acre to provide a 60-foot right-of-way. Additional easements of 4 acres permanent and 8 acres temporary will be needed for maintenance and for construction equipment access. These areas will be shaped and seeded after construction. No relocations are anticipated because of the work.

It is expected that actual construction time for the Wilbur channel work will be less than 1 year. The work will likely be scheduled during a summer construction season.

1/ See drawing, sheet 2, Appendix H

(Creston Area) 1/

The key to the project design is the diversion of waters that normally flow into Creston. These waters come from the nearly flat areas northeast and east of the town and from the drainage gullies of Creston Butte to the south. The water will be intercepted and diverted before reaching the town.

The waters which flow toward Creston from the northeast will be diverted by a new shallow floodwater diversion 2,200 feet southeast to the wetland areas east of Creston.

These wetland waters would normally continue to flood westwardly into town. Water will then pass through a culvert under State Highway 2. A new floodwater diversion will then carry the water 1,360 feet southeast to join with another ditch which is diverting water normally flowing north into Creston from Creston Butte.

Water runs off Creston Butte through two draws. The easternmost draw's runoff will be controlled with a small diversion dam. Runoff will be carried by a floodwater diversion east about 700 feet, under the railroad tracks and thence east 1,300 feet and joins the floodwater diversion described above. The two ditches join and then a new channel carries water easterly 2,300 feet. This channel outlets outside of the watershed at the headwaters for Sinking Creek. Sinking Creek eventually joins Goose Creek a few miles below Wilbur. The west draw's runoff will be controlled with a small debris basin.

After construction, the disturbed areas will be shaped and seeded.

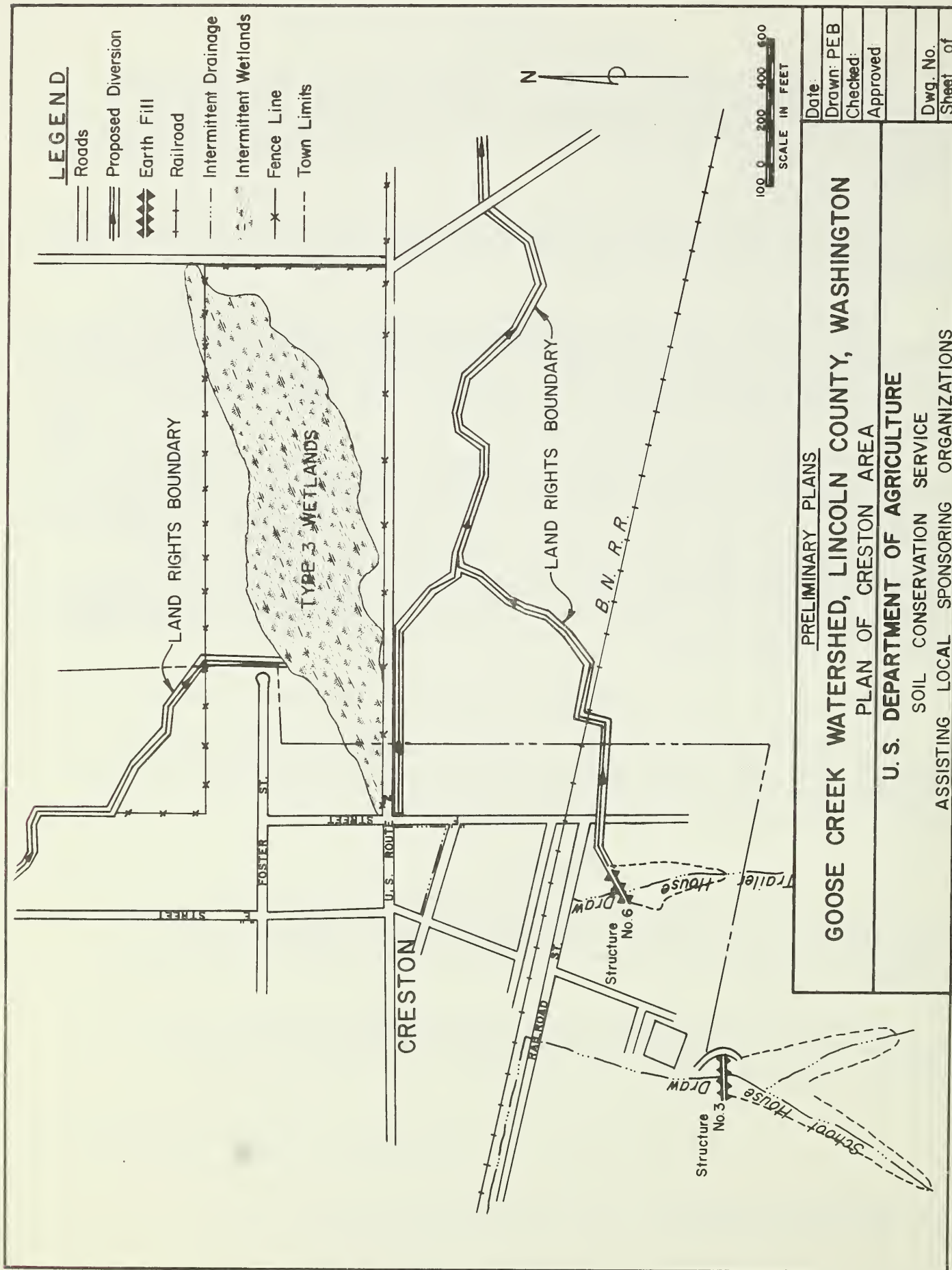
The Creston area project will require the permanent land rights of about 32 acres and flowage easements on 27 acres. Land use is 27 acres of cropland and 5 acres of pastureland for the permanent land rights, and 27 acres of pastureland for the flowage easement.

(General))

Establishment period for vegetative work associated with the structural measures is to terminate when either adequate vegetative cover is obtained or two growing seasons have elapsed after initial installation of vegetative work.

During the establishment period for vegetative measures, SCS may approve PL-566 cost sharing for additional work required to obtain an adequate vegetative cover.

1/ See drawing sheets 5,6, & 7, Appendix H and page 12.



The National Park Service will be notified if any previously unidentified evidence of cultural values are discovered during detailed investigations or construction and procedures in PL 93-291 will be followed. Since this is a federally assisted local project, there will be no change in the existing responsibilities of any federal agency under Executive Order 11593 with respect to archeological and historical resources.

All local, state and federal laws and regulations will be complied with during construction of the project. This includes all permits required by the Washington State Department of Ecology.

Operation and Maintenance

Operation and maintenance costs include all necessary expenditures after installation to realize the estimated benefits during the 100-year project evaluation period.

The town of Wilbur will assume responsibility for operation and maintenance of the multipurpose structure upon its completion. The reservoir will be operated to use the storage to an elevation of 2218.5 feet for recreational purposes.

By November 1 of each year, the gated outlet at elevation 2214.5 will be opened to draw the reservoir level down for flood control. This gate will remain open until March 15 of the following year, at which time it will be closed to allow the reservoir to fill for recreational purposes. The town of Wilbur will have control of the gated outlet.

The operation and maintenance work on the multipurpose structure will consist of such items as; repairing damage to structural embankment and emergency spillway, making replacements and repairs as needed, removing trash from the permanent pool, control of undesirable vegetation on the embankment and emergency spillway areas. Also included is the operation and maintenance of the gated outlet on the principal spillway and stream gages.

The town of Wilbur will also assume responsibility of the operation and maintenance of channel work installed as part of the project. This work would consist of such items as controlling adverse vegetative growth and removing debris and/or excavation of shoal deposits, as required, to reduce serious bank erosion and maintain the design channel capacity. Additional items may be the repair of critical areas by seeding or placement of stone or rip rap, and repair or replacement of appurtenances.

The town of Creston will be responsible for operation and maintenance work associated with the works of improvement to be installed to relieve the flooding problem in Creston. Items of work will include controlling adverse vegetative growth, repair of critical areas, repair or replacement of appurtenances, and any work required to maintain the capacity of the diversions.

The town of Wilbur will be responsible for operation, maintenance and replacement of the recreational facilities until a recreation district is formed to take over the responsibility. Cost involved will be for providing personnel and equipment and repairing and replacing facilities. A schedule of 25-year replacement of nondurable facilities was developed. Water purchased from the Bureau of Reclamation at a cost of \$0.287 per acre foot will be a part of operation and maintenance.

An agreement between the sponsors and the Bureau of Reclamation will be signed prior to construction of the project. Replacement water will be pumped from Lake Roosevelt and transported to Potholes Reservoir through existing distribution systems.

To realize project benefits, a periodic restocking of the reservoir will be needed to maintain a quality fishery. Maintenance of a successful trout fishery in Goose Creek reservoir will be dependent on a program of controlling undesirable species of fish. Periodic stocking to maintain trout fishery will be carried out by the Washington State Department of Game under an agreement to be signed with the recreation district.

All operation and maintenance activities will be conducted in a manner to minimize adverse environmental effects.

SCS and the sponsors will make a joint inspection annually and after unusually severe floods, and after occurrence of any unusual conditions that might adversely affect the structural measures. These inspections will continue for 3 years following the installation of each structure. Inspections after the third year will be made annually by the sponsors. They will prepare a report and send a copy to the SCS. Appropriate officials of the Washington State Department of Ecology and local public health officials will be invited to participate in all inspections.

An operation and maintenance agreement, detailing responsibilities of the sponsor and the SCS regarding establishment period and other items, will be executed prior to signing land rights or project agreements.

Operation and maintenance schedules will be prepared for each structural measure and will follow procedure as set up in the State Watershed O&M Handbook.

The O&M agreement will include specific provisions for retention and disposal of property acquired or improved with PL-566 financial assistance.

The town of Wilbur, the recreation district to be formed, and the town of Creston all have the authority to finance operation and maintenance work assigned to them by either taxation or special assessment.

The total estimated amount of operation, maintenance, and replacement cost is \$28,520. This includes the cost of operation, maintenance, and replacement for the recreation development which is \$13,625. Lake rehabilitation and restocking is \$7,120; \$750 for the Creston diversion, \$500 for the Wilbur channel work, and \$6,525 for the multipurpose structure.

The land treatment measures will be operated and maintained by owners and operators of the farms under agreement with the Lincoln County Conservation District. Technical assistance will be provided by the Soil Conservation Service.

Project Costs

Project installation costs are itemized as follows:

Installation Cost Item	Estimated Cost (1974 Dollars)		
	PL-566	Other	Total
Total Land Treatment	250,000	1,376,430	1,626,430
Total Structural Measures	1,802,030	523,240	2,325,270
Subtotal Construction	1,273,895	376,125	1,650,020
Total Project	2,052,030	1,899,670	3,951,700

E. ENVIRONMENTAL SETTING

Physical Resources

Goose Creek watershed encompasses 40,818 acres, or 63.8 square miles, of Lincoln County, Washington. The towns of Wilbur (population 1,056) and Creston (population 326) form the major population centers within the watershed. Wilbur is about 65 miles west of Spokane (population 180,000), and 20 miles southeast of Grand Coulee Dam. Creston is 8 miles east of Wilbur.

This northeast Washington watershed is in the Columbia-North Pacific Water Resource Region. The region includes all of the Columbia River drainage, the coastal streams of Oregon and Washington, and the closed basin in south central Oregon. Major physiographic features include the Olympic Mountains, the Willamette-Puget Sound Trough, the Cascade Range, and the Columbia Plateau-Blue Mountains-Snake River Plateau. More than 30 percent of the region lies in the area designated physiographically as the Northern Rocky Mountains.

Upper Columbia subregion 1709 includes Stevens, Ferry, Okanogan, Chelan, Douglas, Grant, Lincoln, Adams, and Franklin counties in north central Washington. This subregion has a total area of 22,893 square miles, including 450 square miles of large bodies of water. About 52 percent is in private ownership, the balance in public lands.

Several of the climatic conditions of the watershed are typical of the subregion. Annual precipitation occurs mostly in the winter months, resulting in erosion and sedimentation. Occasionally, the wintertime rainfall occurs when the ground is frozen, magnifying runoff and erosion rates. The summers are conducive to the growth of dryland small grains, the principal crop. The watershed rarely experiences intense summer convection type storms, common to this subregion.

Goose Creek watershed is an area of gently rolling cropland and rangeland, bordered on the north by canyons draining into Lake Roosevelt, formed by Grand Coulee Dam on the Columbia River. Major problem areas are the towns of Creston and Wilbur. Flood plain areas in Wilbur and Creston that would flood once in a hundred years are 158 and 73 acres, respectively.

(Soils)

The upland soils in the watershed have formed mainly in silty windlain deposits (loess) and the bottomland soils have formed in alluvium. In some areas, basalt bedrock and gravel are exposed at the surface. The soils range in depth from very shallow to very deep and are underlain by basalt bedrock, glacial outwash gravel, and a lime-silica cemented hardpan.

About 80 percent of the total watershed acreage consists of very deep, well drained silt loams. About 70 percent of this acreage (56 percent of the total) is strongly sloping to moderately steep; and 30 percent (24 percent of the total) is nearly level and gently sloping. Within

these areas are inclusions of steep soils, soils in small undrained basins, and soils underlain by basalt, gravel, or a hardpan, at a depth of 20 to 60 inches. These soils are used for small grain.

Channel scabland makes up about 15 percent of the watershed acreage. This consists of a complex of well drained, nearly level to strongly sloping silt loams underlain by basalt bedrock or gravel at a depth of 5 to 40 inches, interspersed in small bodies with areas of exposed bedrock and gravel. These soils are used for grazing.

About 4 percent of the acreage, between the channel scabland and the very deep soils, consists of well drained, nearly level to strongly sloping silt loams underlain by basalt bedrock and gravel at a depth of 20 to 40 inches. These soils are used for small grain.

About 1 percent of the watershed acreage consists of very deep, nearly level soils on bottom lands. Most of these soils are well drained but some have impeded drainage and are strongly alkaline. These soils are used for small grain, hay, and pasture.

(Geology)

Bedrock throughout the watershed consists of successive basalt flows of variable thicknesses. These basalt flows are part of the Columbia River group which are of Miocene age. Bedrock throughout the uplands is overlain by the Palouse formation. This is a wind-blown silt deposit of early Pleistocene age.

Goose Creek flows through part of a large, ancient glacial meltwater channel. Glacial waters have created typical scabland topography.

The lower section of the valley walls consists of nearly vertical basalt exposure with a rock talus slope. The upper valley walls taper to moderate slopes and have some soil development. Two separate flood plains can readily be seen as determined by a 4- to 6-foot difference in elevation. The upper flood plain lies on basalt rock that was eroded by glacial meltwaters. It represents the upper terrace of a deep channel that has been subsequently filled with unconsolidated deposits. These deposits represent alluvial and lacustrine silts, sands, and pumicite of modern and late Pleistocene age.

Basalt bedrock within the area has been mined to provide ballast and aggregate for roadbed and surface. The thickness of the basalt flows probably preclude the existence of metallic minerals in the area.

Ground water in large quantities is available at depths of 300-500 feet in the lower watershed. Yields from wells decrease near the Columbia River.

Goose Creek watershed lies within the Columbia Lava Plateau Province. The lower 3.5 miles of the main channel valley lies in a steep-sided coulee that has a width of about 1,300 feet and a depth of about 60 feet. The major portion of the watershed consists of loess-mantled, gently rolling hills. The total relief is about 676 feet, ranging from an elevation of 2,816 to 2,140 feet.

(Climate)

Precipitation varies with differences in elevation. Higher elevations may receive 17 inches per year, while lower elevations may receive only 12 inches. Average annual precipitation at Wilbur is 12.93 inches, distributed as follows:

January	1.66	July	.41
February	1.13	August	.35
March	1.03	September	.70
April	.83	October	1.25
May	1.21	November	1.57
June	1.20	December	1.59

Mean temperature for Wilbur is 46° with July and August temperatures averaging 67° and January and December temperatures averaging 24°. Temperatures in excess of 100° can be expected during summer and 10° to 20° below zero is not uncommon during winter months. Growing season (temperature above 32° F) is 111 days.

(Land Use)

Land use is 81 percent (32,965 acres) cropland, 15 percent (6,000 acres) rangeland, 2 percent (750 acres) pastureland, and 2 percent (1,103 acres) urban, roads, and other. The major cropping system is a winter wheat - summer fallow rotation. Some higher rainfall areas have a winter wheat - barley - fallow rotation.

Range condition varies from poor to excellent and is relatively free from soil erosion. Considerable water is lost during spring thaw due to steep slopes and rocky surfaces.

(Surface Water Resources)

Surface water resources are limited. Goose Creek, through Wilbur, has a low summer flow of less than one cfs^{1/}; and Sherman Creek has summer flows of about one-half cfs. Flows through the proposed reservoir area are intermittent, with 1 to 2 months of no flow during the summer.

Goose Creek waters originate northwest of Creston and flow intermittently south and west 6 miles, where they are joined by a tributary, Sherman Creek, flowing from the north. The stream continues west 4 miles

^{1/} Cubic feet per second.

to Wilbur and then 1 mile to the watershed boundary. Several springs supplement flows between the origin and Wilbur. By the time Goose Creek reaches Wilbur, it is a perennial stream. Goose Creek then flows southwesterly 3.5 miles, where it joins Sinking Creek and becomes Wilson Creek. Wilson Creek flows southwest entering Crab Creek at the town of Wilson Creek.

Wetlands amounting to 119 acres exist within the project watershed. There are 30 acres of Type 1; 34 acres of Type 3; 34 acres of Type 4; 10 acres of Type 5; 2 acres of Type 9; 2 acres of Type 10; and 7 acres of Type 11.^{1/} The majority of these wetlands are small potholes averaging just over 0.5 acre, located in the eastern portion of the watershed in Section 4, Township 26N, Range 34E, just north of Creston. There are 2 relatively large wetlands: a 19-acre Type 4 wetland 1 mile west of Wilbur, and a 19-acre Type 3 wetland on the east edge of Creston. There are 9 acres valuable to wildlife, in three reaches of perennial stream; the longest, 3.5 miles with perennial flow beginning about one-fourth mile east of Wilbur in Goose Creek in a well defined but altered channel; the second, on Goose Creek, 0.4 miles long, beginning about 0.5 mile west of the east side of Section 1, Township 26N, Range 33E, is also a well defined man-altered channel. A 2.1 mile reach with perennial flow is on Sherman Creek, beginning about 0.5 mile south of the northwest corner of Section 1, Township 26N, Range 33E. This section is a well defined natural channel. All other streams are intermittent.

The standard for water quality in Goose Creek and its tributaries, as set by the State of Washington Department of Ecology, is Class B Good.^{2/}

A water testing schedule was set up during the 1975 runoff period. The results of these tests are shown in Appendix G. Also shown are results of spot checks taken prior to the scheduled testing.

All tests run during the high runoff periods fall within the Class B Good standards for total Coliform Organisms. During periods of low flow, when livestock are using the creek for water, the tests exceed the limits of Class B Good waters.

A general standard of what constitutes Class B Good waters is included in Appendix G.

^{1/} U.S. Fish and Wildlife Circular #39

^{2/} State of Washington Department of Ecology, Chapter 173-201 WAC, Water Quality Standards

Present and Projected Population

The 1974 population of Goose Creek watershed is estimated at 1,580 persons. Wilbur and Creston, respectively, are estimated to contain 1,140 and 350 persons. There are about 30 farm homes, averaging an estimated 3.0 persons per home, or 90 persons.

Goose Creek watershed is typical of most rural eastern Washington areas, in that population tends to decline as farm operations increase in size. Usually, when a farmer retires or leaves the industry, his farm is taken over by an adjoining farm or divided among several other operators. Opportunity for new farmers entering the industry is extremely limited. As in the remainder of the county, most high school and college graduates coming onto the job market leave the area because there are so few job opportunities.

This trend is expected to continue. Series C OBERS^{1/} projections for the Upper Columbia subarea, 1709, in which the watershed is located, projects an increase from the 1970 population of 194,629 to a 2020 population of 285,200. The official State of Washington population projections for Lincoln County however, show a decline from the 1970 population of 9,572 to a 2000 projected population of 7,900. The town of Wilbur may not decline at the rate of these projections.

^{1/} OBERS projections of Economic Activity in the United States, Vol. 1, prepared by the U.S. Department of Commerce, Social and Economics Statistics Administration, Bureau of Economic Analysis, Regional Economics Division; and the U.S. Department of Agriculture, Economic Research Service, Natural Resources Economics Division for the U.S. Water Resources Council, 2120 L. Street N.W., Washington D.C. 20037 September 1972, based on the SERIES "C" Projected National Population, Bureau of the Census, 1967.

Economic Resources

Goose Creek watershed is a typical grain-fallow producing area of Lincoln County. In 1973, the watershed wheat production was 885,600 bu.^{1/} This was about 1 percent of all wheat produced in the state. The average yield of winter wheat in the watershed is about 55 bu. Spring wheat, which is primarily used to replant damaged areas, yields 35 bu. per acre. Barley is grown in the higher rainfall areas where a 3-year rotation is used. It will usually yield about 1 ton per acre. Dryland alfalfa yields 2 tons per acre.

Agriculture provides most of the economic base for the watershed and county. Total value of all agriculture products in the county was \$22,221,170;^{2/} \$16,770,840 for crops, \$5,337,872 for livestock and poultry, and \$112,458 for forest products.

Accessibility of farms and ranches to markets is good to excellent. There are commercial grain storage elevators at Wilbur, Creston, and Sherman. An excellent livestock sales yard is located at Davenport, about 20 miles from the southeast corner of the watershed. Roads vary from good gravel to paved surfaces. There are a few dirt roads having only light summer use. The Burlington-Northern Railroad services the watershed via a spur line which extends from Spokane to Grand Coulee Dam.

There are 137 separate ownerships of land (farms and ranches) in the watershed. Land ownership varies in size from 20 to 1,500 acres. The 55 farm and ranch operations vary in size from 25 to 3,470 acres, averaging 1,634 acres.

The following is a breakdown of the total amount of land these 55 operators farm:

Number of farmers operating less than					500 acres	5
"	"	"	"	between	500 - 1,000	" 11
"	"	"	"	"	1,000 - 2,000	" 23
"	"	"	"	"	2,000 - 3,000	" 10
"	"	"	"	"	3,000 - 4,000	" 3
"	"	"	"	"	4,000 - 5,000	" 3
					TOTAL	<u>55</u>

It is not uncommon for a farmer to live in Wilbur and commute to his farmland. The farm may be divided into parcels as much as 20 miles away from each other.

1/ Washington Wheat Commission

2/ 1970 Census data

Total land areas are summarized in the table below.

Wilbur* (town limits)	704	acres
Creston* (town limits)	228	"
State**	520	"
Federal	0	
Private farms & ranches (includes 5 ac. of water)	39,245	"
Road and railroad rights-of-way	121	"
TOTAL	40,818	acres

The 39,765 acres, including 520 acres state land in farms and ranches, includes 32,965 acres of cropland selling for about \$275 per acre, 750 acres of pastureland selling for \$175 per acre, and 6,000 acres of rangeland valued at \$30 per acre. Fifty acres are used for farmsteads.

According to the Washington State Employment Security Department, unemployment has remained between 4 and 5 percent for the past 5 years. This rate, however, does not accurately portray employment conditions in the watershed and county. Employment conditions make it necessary that young people leave the area rather than remain.

Employment and income distribution in Lincoln County is shown on the following page.

* No excessive amounts of vacant undeveloped land.

** Scattered parcels with farming privileges leased back.

EMPLOYMENT DISTRIBUTION IN LINCOLN COUNTY^{1/}

Industry	Number of Workers	Percent
Agriculture, forestry, and fisheries	1,145	32
Construction	247	7
Manufacturing	248	7
Railroads and railway express	63	2
Wholesale trade	87	2
Eating and drinking	143	4
Other retail	776	22
Hospitals and health service	183	5
Education	326	9
Public administration	206	6
Other	143	4
TOTAL	3,567	100

INCOME DISTRIBUTION IN LINCOLN COUNTY^{1/}

INCOME OF ALL FAMILIES IN LINCOLN COUNTY^{2/}

Salary	Number	Percent
Less than \$3,000	208	8
3,001 to 11,999	1,623	61
12,000 to 14,999	412	15
15,000 to 49,999	438	16
TOTAL	2,681	100

^{1/} 1970 Census

^{2/} Median income is \$9,213. Mean income is \$10,084.

Plant and Animal Resources

Native vegetation is varied and complex and is typical of the channeled scabland with hummock and swale of eastern Washington. There are about 6,000 acres of range (15 percent of the total watershed) used for grazing domestic livestock. This area is also very important as a habitat for numerous wildlife species.

Variability of soil depth and landscape position result in four major range sites.

About 2,650 acres (44 percent) is the loamy site with soils over 20 inches deep. Three-tip sagebrush is the dominant shrub and Idaho fescue the constant grass when under excellent range conditions. Big sagebrush is present in minor amounts as is bluebunch wheatgrass, threadleaf sedge, and Sandberg bluegrass. Other important species are phlox, blue-eyed grass, larkspur, shooting star, yellowbill, buttercup, death camas, lupine, and arrowleaf balsamroot. About half of this area is presently in good range condition and about half in fair range condition. Rabbitbrush, annual grasses and forbs have invaded the site, while native sagebrushes, Sandberg bluegrass and native forbs have increased as a result of overgrazing. Idaho fescue and bluebunch wheatgrass have decreased.

Scattered ponderosa pine and patches containing currant, snowberry, rose, serviceberry, and isolated plants of elderberry also occur. These are located in small basins and in draws affording greater moisture supply. This tree and shrub acreage, though limited in size, is very important for wildlife species.

About 1,100 acres (19 percent) is the shallow range site having soils 10 to 20 inches deep. Big sagebrush is the dominant shrub and bluebunch wheatgrass the dominant grass under excellent range conditions. Horsebrush and rabbitbrush occur in minor amounts but increase abundantly, as does big sagebrush when bluebunch wheatgrass and thurber needlegrass are overgrazed. Other important plants are Sandberg bluegrass, biscuitroot, balsamroot, fleabane, and lupine. These secondary plants increase, and annual grasses and weeds invade this site as conditions deteriorate because of continued overgrazing. About 40 percent of this site is presently in good range condition and the remainder is in fair and poor range condition.

About 2,000 acres (33 percent) of the rangeland consists of the very shallow site with soils that are 5 to 10 inches deep. Stiff sagebrush, shrubby buckwheat and Sandberg bluegrass are the most dominant plants. Other important plants are bitterroot, fleabane, larkspur, goldenweed, phlox, and wild onion. Present range conditions are good to excellent. This site sheds abundant water because of its inability to store it in the very shallow soils.

Mule deer use stiff sagebrush and shrubby buckwheat readily for late fall and winter food.

About 250 acres (4 percent) of rangeland is the bottom land site that occurs along streams and draws. The soils are over 40 inches deep and receive extra moisture because of their position. Important plants are big sagebrush, rabbitbrush and giant wild ryegrass. Bluebunch wheatgrass, big bluegrass, and Idaho fescue used to be present but have been replaced by increased brush, annual grasses, and weeds as a result of overgrazing. This bottom land site is mostly in poor or fair range condition. It is extremely important for wildlife habitat because of its position, sheltered from the wind, and usual proximity to water and livestock winter feeding areas.

Throughout the watershed, small patches of red-osier dogwood, hawthorn, rose, quaking aspen and willow occur around potholes and along Goose and Sherman creeks. Patches of rose and scattered serviceberry occur along the base of cliffs and talus slopes. These areas all provide cover and food for wildlife species.

There is a total of 750 acres of mixed grassland areas composed of native grasses with a few shrubs and grass seedings.

Each of the four range sites contains a variety of plant communities as the result of successional trends and the gradual transition between range conditions. Within each association, some wildlife species benefit and others may decline as range conditions improve or deteriorate.

Wildlife includes white-tailed deer, mule deer, coyote, raccoon, badger, muskrat, mink, weasel, yellow-bellied marmot, white-tailed jack rabbit, cottontail rabbit, ring-necked pheasant, gray partridge, mourning dove, waterfowl (dabbling ducks and geese) along with numerous other small animals and non-game birds, such as ground squirrels, owls, crows, magpies, and many species of songbirds. There are many opportunities for improving wildlife habitat.

Principal deer habitat is 6,750 acres of grassland, typified by scattered sagebrush and rabbitbrush, with small patches of brush in protected areas. Adjacent wheatfields provide additional food in spring and early summer. Lack of cover and limited winter range results in a poor habitat classification for the area. Based on an average of one deer per square mile for this type of habitat in Lincoln County, and noting the lack of adequate cover within the cropland portion, a population of not more than 50 deer occupy the watershed.^{1/}

Cottontail rabbits are common along Goose Creek and Sherman Creek. Typical habitat is composed of brushy areas, talus slopes, abandoned buildings and heavy cover throughout sagebrush-bunch grass area. Based on abundance and type of cover available, 750 acres of pastureland, 6,000 acres of rangeland, and 32,965 acres of cropland with few isolated patches of cover, there is a population of about 270 cottontail rabbits. The best

^{1/} Data from Washington State Department of Game Blue Book.

cover is located along the lower half of Sherman Creek and scattered areas along Goose Creek.

Primary habitat for furbearers is 7.1 miles of perennial stream located in three reaches along Goose Creek and Sherman Creek. Perennial streams provide the best habitat for both mink and muskrat, with populations of about six per mile of stream. Potholes similar to those located in the eastern portion of the watershed provide poor to fair habitat. Based on this habitat, about five mink and 40 muskrat occupy the watershed. Beaver are occasionally found, but no resident population exists at the present time.

Ring-necked pheasant are common for 6 miles along Goose Creek, east of Wilbur and for 4 miles up Sherman Creek. These birds feed in grain-fields adjacent to adequate cover. The majority of the watershed, 52 square miles, is poor pheasant habitat, with large expanses of wheatfields and very little cover. The remaining 11 square miles is a mixture of scabrock, pastures, and sagebrush habitat. At present, the pheasant population is down, but based on habitat present, about 450 birds use the watershed.

The population of gray partridge, locally known as "Huns", is low following a series of hard winters, but is now increasing. Prime habitat for gray partridge is pastureland bordered by wheatfields; 750 acres of this type are present in the watershed. Sagebrush habitat occupies 6,000 acres, with the remaining 32,965 acres in small grain-fallow with little or no cover. An estimated population of 350 birds are in the watershed during the fall.

The mourning dove is a common summer resident between March and October in the Goose Creek area. Doves primarily feed in open areas and require water daily. Doves require no definite vegetation type for nesting, but prefer to nest in native trees and windbreak plantings. A broad ranking of habitat present in the watershed would be 6,750 acres of rangeland and pastureland as fair habitat and 32,965 acres of cropland as very poor habitat. Under these conditions, about 300 doves occupy the watershed.

Wetlands consist of 30 acres of Type 1; 34 acres of Type 3; 34 acres of Type 4; 10 acres of Type 5; 2 acres of Type 9; 2 acres of Type 10; and 7 acres of Type 11. There are 7.1 miles of permanent stream with a surface area of about 9 acres. This type of habitat is suitable for dabbling ducks and associated species; but there is not enough deep water for diving ducks.

Principal species nesting on the watershed are mallard, pintail, American widgeon, blue-winged teal, cinnamon teal, and coot. A total of about 60 nesting pairs use the watershed. Canada goose nesting habitat is very limited. However, an occasional pair does nest on the watershed.

During the fall migration, a population of about 5,000 ducks and geese use the area, depending on moisture conditions. In a year where late summer rains have refilled the potholes, fall migrant populations may exceed 10,000 ducks and geese. In dry years, fall migrant populations may be a few hundred. Spring migration is much more consistent with about 9,000 ducks and geese and about 100 swans using the watershed as a stopover while moving north into Canada.

There are 7.1 miles of perennial stream that are capable of supporting game fish through the summer months. Species of fish present include rainbow, brook, and brown trout, with populations of shiners, suckers, and sculpins. Of the game fish, rainbow trout are the most abundant; but because of restricted habitat, there are very limited populations.

There are no rare or endangered species, flora or fauna, which are native to the watershed.

Recreational Resources

The watershed and most of Lincoln County is now devoted to crop and rangeland. This land use offers limited potential for recreational development. Hunting success is limited because of the habitat. Streams are mainly intermittent, which greatly restricts their use as a fishery. The fishery is presently used to its potential in most cases.

Some of the recreation facilities at Lake Roosevelt are over-utilized during peak summer months. The lake is managed for hydroelectric power and flood control; therefore, recreational use is not maximized.

An inventory of the existing private developments in the county is shown on page 30.. Public facilities in the county at Coulee Dam National Recreation Area are shown on page 31. Most of the facilities in the county are on main arterials, except for several small developments on Lake Roosevelt which are accessible by water only.

Watershed recreation facilities include a free swimming pool, city park with picnic facilities, nine-hole golf course, Wilbur Meadows Grandstand and Sports Arena, a private 12-vehicle transient camping site, and a private four-vehicle transient camping area. One organized trailer caravan has camped at Wilbur Meadows annually, even though facilities haven't been developed there.

Recreational development is limited by the sparse population and distance from major urban areas. The highway system through Wilbur is used by vacationers going across the scenic North Cascade Highway and those who visit Grand Coulee Dam.

The potential for outdoor recreation in Lincoln County is summarized on page 32.

LINCOLN COUNTY PRIVATE RECREATION <u>1/</u>				
Activity	Acres	No. Guests	Vehicle Sites	Tent Sites
Resident Camping	7	24	---	---
Transient Camping	7	0	48	16
Vacation Camping	13	0	65	122
Field Sports				
Archery		1 range with 2 positions		
Shooting		5 ranges with 70 positions		
Fishing Enterprises		3 lakes with 18 acres		
Driving Range		6 acres with 12 positions		
Golf, Regular Course		196 acres with 27 holes		
Waterfowl hunting		60 acres		
Picnicking		5 acres with 24 tables		
Rodeos		8 acres of grounds		
Total Trails		25 miles (horse and hiking)		
Vacation Ranch		1 containing 1,200 acres and accommo- dating 34 guests		
Boating		(Number of rentals)		
Sailboats		1		
Rowboats		142		
Motorboats		4		
Boat launch ramps		3 single-lane ramps		

1/ Washington State Interagency Committee for Outdoor Recreation,
Public Recreation Lands Inventory

COULEE DAM NATIONAL RECREATION AREA LOCATED IN LINCOLN COUNTY*

Developed Area	Camp Sites	Picnic Sites	Capac. Group Camping	Boat Ramp	Boat Fuel	Boat Dock	Access by boat Only	Water	Trailers	Lifeguard	Dump Station Trailer Floating
Spring Canyon	79	52	25	X	X	X		X	X	X	X
Keller Ferry	22	15		X	X	X		X	X		
Jones Bay	3	2				X	X				
Hawk Creek	7	2		X		X			X		
Fort Spokane	58	58	50-75	X		X		X	X	X	X
Detillion	12	1				X	X	X			
Porcupine Bay	31	28		X		X		X	X	X	

All developments are accessible by water.

In the summer the larger campgrounds are usually about 85% filled, with weekend overflows.

Local use is very heavy at Keller Ferry.

Waterskiing has been somewhat restricted in the lower area because of debris caused by the fluctuation of the lake.

* National Park Service

SUMMARY OF THE APPRAISAL OF POTENTIAL
FOR OUTDOOR RECREATION DEVELOPMENT
Lincoln County

Kind of Development	Rating for Potential Development
I. <u>Vacation Cabins, Cottages, Homesites and Youth Camps</u>	High
II. <u>Camping Grounds</u> Vacation site Transient	Medium Medium
III. <u>Fishing Waters</u> Warm Water Cold Water	Medium Medium
IV. <u>Hunting Areas</u> Small Game Big Game Waterfowl	Medium High Medium
V. <u>Water Sports Area</u>	Medium
VI. <u>Winter Sports Area</u>	Medium

Archeological, Historical, and Unique Scenic Resources

Prior to the coming of the white man in the 1860's, members of various Indian tribes apparently used the sheltered creek bottoms for camping. The town of Wilbur was established by an early trapper as a trading post. The site was chosen for its proximity to the several springs lying both east and west of the town.

A study was made of the watershed by the Washington Archeological Research Center. They found one small archeological site containing material suggestive of sporadic use by aboriginal peoples, a number of semicircular pits in the talus slopes, and a few flakes of modified chert. The small archeological site, near the multipurpose reservoir, will be nominated to the National Register of Historic Places. Investigations showed that there are no other known sites in or eligible for the National Register of Historic Places.

Consultation has also taken place with the National Park Service, Pacific Northwest Regional Office, the State Historic Preservation Officer, Eastern Washington State Historical Society, and the Lincoln County Historical Society. 1/

Travelers over Highway #2, a main highway linking eastern Washington with central and western Washington, can view the alternate wide open terrain of the rolling wheatfields with the channeled scabland terrain of the range. Immediately to the north is the backwater from Grand Coulee Dam called Roosevelt Lake. Roosevelt Lake and its associated recreation area is a scenic and awe-inspiring sight when viewed from the upper part of the watershed.

1/ See Appendix F

Soil, Water, and Plant Management Status

Activities of the Conservation District have included information-education programs throughout the district, which encompasses the Goose Creek Watershed area. Soil Conservation Service technical assistance through the district has been provided to the farmers and ranchers in the watershed. Some of these operators have applied various conservation practices to their land. Others have done very little to reduce soil and water loss from their fields.

The Board of Supervisors are working towards a strong conservation program in this watershed and are looking toward the farms in this portion of the district to be a good demonstration of what can be accomplished by applying sound conservation measures. They hope to accomplish this by concentrating the Board's efforts along with Soil Conservation Service technical assistance and the increased assistance of other agencies and groups.

Fifty-one percent of the total farm and ranchland acreage is covered by cooperator agreements, or 20,440 acres of the total 39,765 acres. Of the 55 operators, 25 (45 percent) have signed cooperative agreements with the district, and nine (16 percent) have conservation plans. There are 9,560 acres (24 percent) with conservation plans.

The land that at present is adequately treated includes approximately 7,000 acres of cropland and pastureland, and 1,500 acres of rangeland.

Less than 15 percent of needed land treatment practices have been installed. The exception to this is chiseling (47 percent), grassed waterways (23 percent), proper grazing use (50 percent), and deferred grazing (25 percent).

Projects of Other Agencies

The Bureau of Reclamation has two separate project proposals within the watershed area. Both are considered as long range proposals.

One proposal could provide irrigation water to the approximate elevation of 2,200 feet in the Wilbur area. This would provide irrigation water for the lower areas near Wilbur. The project is presently in the preliminary stage, with planning work continuing as time and money permit.

Another Bureau of Reclamation proposal, to provide irrigation and peak power supply, would be a reservoir located high on Sherman Draw. This project has had planning suspended, as it is considered unfeasible at this time.

As this project would be for peaking power, it would not provide recreation. This project could provide added life for the proposed multipurpose structure of the sponsors by reducing sediment load. There is no conflict of interest between Bureau of Reclamation irrigation proposals and local flood prevention objectives.

The storage of water in the proposed watershed reservoir does conflict with present water rights to Potholes Reservoir. This reservoir on Crab Creek was built by the Bureau of Reclamation to provide irrigation water storage for the Columbia Basin Project, and is located about 60 miles downstream from Wilbur. The Bureau of Reclamation has all floodwater rights to Crab Creek drainage, of which Goose Creek is a part, from November 1 to April 15. Retention of the Goose Creek floodwater from March 15, when the storage gate is closed, to April 15, will require a written agreement between the project sponsors and the Bureau of Reclamation, assuring the Columbia Basin Project that an encroachment of their existing rights will not result. It is anticipated that such encroachment will occur rather infrequently, once the reservoir fills; however, when it does, the local sponsoring organization will have to pay for replacement water to the Potholes Reservoir.

F. WATER AND RELATED LAND RESOURCES PROBLEMS

Land and Water Management

Individual farms and ranches in the watershed face many inherent land treatment problems.

The precipitation ranges from an average annual of 12 inches at Wilbur to about 17 inches in the upper portions of the watershed. This in turn affects the potential cropping systems that are feasible, practical, and profitable.

Generally deep soils can produce a crop every other year in a wheat-fallow rotation. Shallow soils generally are limited to rangeland forage production. Cropland is thus locked into a mono-culture of small grain. Eighteen inches of precipitation and over is generally considered necessary for annual grain production. Between 15 and 18 inches is more compatible to a 3-year rotation of wheat-barley-fallow or similar cropping system. Thus the average precipitation assures the success of a wheat-fallow rotation, other factors being equal. It does not assure a successful 3-year rotation except during years of above average precipitation.

Wheat-fallow can be a highly erosive system during the winter and spring after seeding fall wheat. Generally erosion is negligible over the winter and spring following harvest. Stubble-mulch farming, cross-slope or contour seeding, and early seeding are basic conservation practices that can reduce the potential for erosion in winter wheat.

Cross slope or contour chiseling in fall stubble can increase moisture storage and reduce runoff from stubble fields. Wheat-fallow strips employing all those practices can provide additional protection. Sod strips are even more effective. Dividing the slopes in half provides some protection where strips are not feasible or not accepted.

The rolling topography is not conducive to contour farming or contour stripcropping. The lack of adequate outlets and difficulty of establishing and maintaining grass waterways affects the installation of gradient terraces. These problems do not affect level terraces.

Early seeding creates a potential for foot rot problems which reduce yields.

Habit, resistance to change, and cost of new equipment contribute to the slow acceptance of stubble mulch farming by some landowners.

On the upland soils used for small grain, the average annual soil loss per acre from the nearly level to gently sloping soils 1/ is estimated to be 2 to 5 tons; from the strongly sloping to moderately steep soils, 2/ 5 to 15 tons; and from the steep soils, 3/ 15 to 35 tons.

Annual soil loss is estimated to be about 1 ton per acre from the rangeland. Conservation treatment on range consists of proper grazing use and deferred grazing.

Erosion rates vary from year to year depending on winter snow accumulation, spring rains, frozen ground conditions, presence or absence of grain residues, and growth of plant cover.

Land use adjustments that are needed include seeding 900 acres of steep soils to a permanent cover of grass. Rotations of grass and wheat will also reduce erosion. The more years in grass in relation to wheat, the lower the average annual soil loss.

Most agronomic conservation practices could be implemented with the purchase of sub-surface tillage equipment. It is not so much the cost of this equipment as it is social factors that restrict the acceptance of stubble mulching.

Land use adjustments can be made without significant economic impact if one individual is not saddled with a large acreage retired from production.

Small, irregular patches of land of steep slope that are seeded to grass do affect efficiency since they must farm around these "islands."

Floodwater Damage

Floodwater damage to urban areas includes the commercial and business district of Wilbur, as well as a large portion of the residential area. There are 116 residences, 93 businesses, public facilities, and commercial buildings which occupy the 1-percent-chance-event flood hazard area (158 acres) in Wilbur. 4/

Flooding within the town of Creston can damage 19 houses and 11 businesses and public buildings for the 1 percent runoff event. Some flooding takes place nearly every year, with waters accumulating in pot-holes in and around Creston. These waters drown out crops in small areas as well as overtaking the existing sanitary sewer system (by running in at manholes). Existing floodwater outlets for Creston are inadequate to

1/ Gently sloping soils refer to slopes of 0 to 8%

2/ Strongly sloping to moderately steep soils refer to slopes of 8% to 25%

3/ Steep soils refer to slopes of 25% or over

4/ See drawing, sheet 1 of 7, Appendix H, which shows the 100 year without project flood plain boundary

handle the waters which originate outside the town limits. Unmanageable ponded waters also produce a vector problem within the town.

Agricultural damage areas include scattered parcels of land lying adjacent to Goose Creek. Land use is predominantly grass hay, with small grains being used in rotation.

Flood records go back to 1889, when it was reported that Goose Creek floodwater extended from "bluff to bluff". Other floods occurred during 1900, 1918, 1931-32, 1943-44, 1957, 1959, and 1972.

The 1957 storm runoff was the largest flow recorded ^{1/} for this watershed. The 1889 storm was probably larger, but no measurements were taken. The 1957 flood caused damages estimated to be \$500,000 ^{2/} within the community of Wilbur. The flood seriously damaged 44 homes and businesses. Additional damages occurred downstream on the main stem of Wilson Creek and to the community of Wilson Creek. The 1957 storm is about a 4 percent runoff event. Storms of this nature are caused by large amounts of early fall moisture followed by cold weather which freezes the soil. At this point, a snowfall of 6 to 12 inches containing a .5 to 1.5 inch moisture is followed by a "chinook" wind and rain. It is not unusual for two or three large runoffs to occur during a winter once the ground is frozen.

Erosion Damage

Erosion rates on cropland average $8\frac{1}{2}$ tons per acre per year. It would take about 19 years to lose 1 inch of topsoil if the erosion were distributed uniformly over the cropland acres. One foot of soil would be lost in 228 years, or $4\frac{1}{2}$ feet of soil in 1,000 years. The 900 acres of cropland on steep soils, however, is eroding at an average rate of 25 tons per acre per year. In 6 years, 1 inch of soil could be lost.

The 10,000 acres (estimate) of cropland on moderately steep soils eroding at an average rate of 10 ton per year would lose 1 inch of soil in 15 years.

Erosion is gradually reducing production, all other inputs being equal. If the 900 acres of steep soils produce 30 bushels to the acre in a wheat-fallow rotation and is taken out of production, it could mean the loss of wheat production valued at about \$54,000 a year.

Range production is not likely to be affected by the minimal erosion rates, but rather by the amount and species of grass produced through improved management.

^{1/} United States Geological Survey

^{2/} 1957 price

FLOODING IN WILBUR FEBRUARY, 1957

Photo 1. Looking east up Main St.



Photo 2. Looking west down Main St.

Photo 3. Looking east on Main St.





Photo 4. Flooding in Wilbur, February, 1957.

PHOTO BY C.C. BAHR, WILBUR WASHINGTON

Erosion rates vary considerably in the watershed area. Soil loss depends primarily on steepness of slope, land use, and management. Over the entire watershed, the average annual erosion rate is estimated to be about 7 tons per acre from sheet and rill erosion. The average annual soil loss from cropland is estimated to be about $8\frac{1}{2}$ tons per acre; from rangeland, about 1 ton per acre; from pastureland about $\frac{1}{2}$ ton per acre; and from urban, about $\frac{1}{4}$ ton per acre. These estimates do not take into consideration the small areas subject to gully, roadside, or streambank erosion. Rates for these areas can be exceedingly high, but they represent a very small fraction of the total watershed.

The major sources of sediment in the watershed are: 900 acres of cropland on steep soils, an estimated 10,000 acres of cropland on moderately steep soils, and some gully and streambank erosion.

A reduction of streambank vegetation by chemical spraying and overgrazing have been the major causes of streambank erosion. Revegetation would reduce the streambank erosion and sediment in the various streams.

Sediment Damage

Total acreage that receives sediment deposition is relatively small. It is estimated that measurable damage by sediment deposition occurs annually on approximately 50 acres of winter wheat. About 15,000 acres are currently in winter wheat each year. It is estimated that 1 percent of the bottom lands in grass receive sediment damage on an annual basis (this is about 8 acres).

Goose Creek, between Sherman Draw and Creston, has five silt basins. During the 1972-73 runoff year, the upper dam collected 4.8 acre-feet of silt, or 1.3 acre-feet per square mile. The average annual rate on these reservoirs has been .35 acre-foot per square mile. The increased rate in 1972 was attributed to many freeze-thaw cycles which occurred during the runoff period.

Sediment is by far the greatest polluter of water within the watershed. Average annual sediment leaving the watershed is 14.0 acre-feet. Average annual water yield is estimated to be 4,200 acre-feet. The average concentration of sediment is 3,340 parts/million.

Irrigation Problems

Present irrigation is limited to the use of early runoff waters along Goose Creek. About 180 acres are flooded by use of dikes. An additional 50 acres are sprinkled. Water rights are on file with the State of Washington's Department of Ecology. One water right for 1.0 cubic feet per second (cfs) exists above the proposed reservoir east of Sherman Road. A second water right of 0.5 cfs exists at a farm to be inundated by the eastern end of the reservoir. Other combined water rights amounting to 2.8 cfs exist below Wilbur. Floodwater rights have been filed on by the Bureau of Reclamation as part of the Crab Creek and Potholes Reservoir project.

There are 29,230 acres that would respond to sprinkler irrigation. Some of the soils have a restrictive caliche layer that would limit root and moisture penetration. The water source for future irrigation is Lake Roosevelt, and would require 1,200-1,500 foot pumping lifts.

Municipal and Industrial Water Problems

Water supply for the community of Wilbur is derived from wells. Present supply is adequate for present use, with additional storage to be added as required. There are no large industrial users of water in Wilbur, nor would the present system be able to supply a large water-using industry.

The anticipated needs during the next 20 years for an increased supply of municipal and industrial water appear slight. Wilbur is the largest incorporated area in the watershed. Wilbur's population has changed little in the past 30 years. If increased water needs develop, these needs would very likely be met by deep well drilling.

Water supply for the Creston community is supplied by a city well. Quality and quantity are adequate for present and estimated future demands.

Both Wilbur and Creston have recently completed sewage lagoons. The systems were designed with extra capacity for future development. Construction problems have made the Creston lagoons operate at less than design efficiency during spring months.

Recreation Problems

Nearby Lake Roosevelt is the largest single potential recreational facility for watershed residents. Some of the present recreational facilities are over-utilized during peak summer months. Over the years, it has not proven to be a good fishery. As a swimming facility, its relatively cool temperature and greatly fluctuating surface level, coupled with varying bottom contours, tend to discourage many would-be bathers. Furthermore, a substantial floating log and debris problem exists on the reservoir. This creates a hazard for boaters on the lake.

The recreation market area of the project from which about 85 percent of the use would originate consists of all or part of the counties of Lincoln, Ferry, Okanogan, Douglas, and Grant. Use by vacationers interested in enroute camping accommodations would also be significant.

According to the Bureau of Census, 1970 population of the recreation market area was 25,827, an increase of about 3 percent from 1960. About 50 percent of the population resides in nonrural areas.

An inventory of recreation facilities and opportunities reveals an inadequate supply of camping, picnicking, sailing, fishing, water skiing, and boating.^{1/} Adequate flat-waters exist on the perimeter of the recreation market area. However, these areas lack development of facilities to fulfill unmet needs.

A comparison of the demand for outdoor recreation generated within the 50-mile zone, and the supply of existing recreational facilities, indicates a need for additional water-oriented recreation developments.

Plant and Animal Problems

Few land use changes are anticipated and there have been none of any significance in recent times. Plant and animal communities are, therefore, fairly stable. Existing cover is of poor quality in many places.

Most streams have no flow for parts of the year. Many streambanks have been denuded of woody vegetation that reduces shade and increases the stream temperature, thus reducing the quality of the stream for cold water fish.

Within the wheat-fallow sections, cover will be the limiting factor for upland game birds. Most of the wetland potholes have dried up by fall and offer no rest areas for migratory waterfowl.

Spring flooding produces many wet areas along the stream channel which are conducive to mosquito breeding. The Type III wetland located east of Creston also produces a mosquito problem in the community. The mosquito is a vector for Equine Encephalitis outbreaks in the area.

Deposition of sediments along and within the stream, as well as streambank erosion, reduces natural habitat and water quality.

Economic and Social Problems

There are no low-income-producing farm units in this watershed, according to the Agricultural Stabilization and Conservation Service (ASCS).

This watershed is not an economically depressed area. The population of Wilbur is stable. Jobs remain at a relatively constant level. There is a need for additional employment opportunities which could come about through additional rural community development. This would permit the younger generations coming into the full-time job market a better choice of remaining in or leaving the community.

Approximately 10 percent of the Goose Creek watershed area is devoted to farms using 1½ man-years or more hired labor each year. Of the 55 farms, six are using this much hired labor.

^{1/} Washington State Interagency Committee for Outdoor Recreation,
Public Recreation Lands Inventory

Water Quality Problems 1/

The standard for water quality in Goose Creek and its tributaries is class B. Tests show that total coliform counts exceed the standards, in isolated cases, during very low flow periods. Nitrate and ortho phosphate critical levels are exceeded throughout most of the year and the nitrite critical level is exceeded infrequently on Sherman Draw.

The problems identified are due to livestock use of the streams and the intense cropland farming activities.

Dissolved oxygen, temperature, pH, ammonia, and alkalinity are all satisfactory for class B waters.

1/ See Appendix G for more detailed data.

IV. RELATIONSHIPS TO LAND USE PLANS, POLICIES, AND CONTROLS

A. Local and County Plans, Policies, and Controls

Lincoln County, Creston, and Wilbur do not have a comprehensive land use plan. A general county-wide zoning ordinance is in effect. The county planning agency provides necessary services to Creston and Wilbur upon request.

The county zoning ordinance does not prohibit any of the planned actions. The area of the reservoir, the dam and the borrow areas, is zoned as Agricultural-Range District. Section 4.85 of the Lincoln County Zoning Ordinance states that a Conditional Use Permit is necessary to conduct open surface mining when obtaining borrow material.

B. Other Plans, Policies, and Controls

The proposed project is not in conflict with any state laws, but a number of permits need to be obtained prior to construction. Some are:

The Department of Ecology requires a reservoir permit for construction of reservoirs with over 10 feet depth or with over 10 acre feet of storage. For projects with capacities greater than 10 acre feet of storage, the Department of Ecology requires review and approval of the structural plans. The Department of Ecology will also require a permit for beneficial use of the storage water.

The Department of Natural Resources requires surface mining permits for borrow areas exceeding 2 acres, or 10,000 tons. Mining and reclamation plans must be submitted and approved before mining permits will be issued.

The Washington Department of Game and the Washington Department of Fisheries require a hydraulics project approval for work within the wetted perimeter of a stream.

The application and compliance to these and all other local and state permits and regulations is the responsibility of the project sponsors.

V. ENVIRONMENTAL IMPACT

A. Conservation Land Treatment

The application of 75 percent of the needed conservation land treatment during the ten year installation period will have a significant impact. Some of the practices and measures that will be incorporated in different combinations to reduce erosion rates include chiseling, stubble mulching, stripcropping or divided slope farming, crop residue use and grass seedings.

The "retention" type of measures, such as, debris basins, grade stabilization structures, and level terraces, collect sediment, reduce erosion rates, and hold moisture for infiltration to the subsoil and perhaps even the groundwater.

Gradient terraces, grass waterways, and streambank protection, involve carrying off excess water and protecting the surfaces exposed to the running water. Erosion will be significantly reduced on areas with high rates of erosion.

The combined effects of land treatment measures on cropland will reduce the annual soil loss from approximately 7 tons per acre to within allowable limits.

Land use will be changed on cropland with the installation of grassed waterways and terraces. Land adequately treated will increase from 7,000 to 26,475 acres of cropland, and from 1,500 acres to 5,550 acres of rangeland.

All other factors, such as climate, fertilizer rates, availability of fuel, and crop varieties being equal, there will be an overall increase in crop production as a long term effect of erosion control and moisture conservation. This could conservatively be estimated at 10 percent in the short term (10-15 years); much more in the long term. 1/

With the application of land treatment measures on rangeland, the forage quality of the plant communities in fair and good range condition will rapidly improve. The important forage species that are now low in vigor will recover and increase their production. This added production will provide protection against erosion.

Animal unit months (AUM) will increase by 25 percent on the rangeland. 2/

Wildlife habitat will be improved by additional food and cover.

The landowners and operators will have to invest money to implement range conservation plans.

1/ Ten ton per acre per year represents a uniform soil loss of about 1/16". In 16 years, one inch of topsoil would be lost and 10 inches to one foot would be lost in 160 years.

2/ AUM - the amount of forage a mature cow with calf will consume in a month.

Sediments are a major source of water pollution. Once the project is installed and land treatment goals met, the watershed erosion rate will drop by 30 percent.

Concentrations of sediment in the runoff waters will decrease from 3,340 milligrams per liter (mg/l) to 1,130 (mg/l). Nutrient levels Nitrogen (N), Potassium (K), and Phosphorus (P) may drop slightly.

Employment needs for land treatment measures are 25 man-years of semi-skilled labor. The improved agricultural efficiency and reduced resource losses will improve the financial circumstances and stabilize incomes of many of the farm/ranch operators.

Land treatment measures will impact the aesthetics of the watershed area. They will add variety to a landscape that is presently dominated by wheat or fallow, and rangeland.

B. Structural Measures

The dam, a reservoir, one-fourth to one-half mile wide by approximately 2.1 miles long, and the recreation facilities, will alter land usage on 95 acres of cropland and 287.5 acres of range.

Minor land use changes may occur in the flood pool, borrow, and other areas (127 acres).^{1/}

Annual sediment yield at the watershed outlet will be reduced from 14.0 AF to 3.7 AF (73 percent) with the project installed. An estimated maximum of 1.153 AF of sediment could be trapped in the reservoirs. Sediment damage will be reduced on 50 acres of cropland and 8 acres of pastureland. Areas downstream of the watershed boundary will also experience less sediment deposition.

A small archeological site, containing material suggestive of sporadic use by aboriginal peoples, may be disturbed by the influx of people into the area using the recreation facilities. The shelter will be on private land and not in the development.

Production on 95 acres of pasture and hay lands would be foregone because of multipurpose structural measures and reservoir storage. These lands annually produce about 200 tons of hay. The 287.5 acres of range-land produce 73 AUMs of forage. About 2,000 bushels of wheat will not be produced during project development on 40 acres in the borrow area. The project in Creston would eliminate grain production on 27 acres which annually produces about 740 bushels of wheat.

Project implementation will eliminate 2.1 miles of intermittent stream channel and associated riparian habitat. This area will be lost as a wintering ground for livestock and wildlife. Also lost will be 2 acres of Type 2, 4 acres of Type 3, 1 acre of Type 4, 2 acres of Type 10, and 1.5 acres of Type 11 wetlands. Lost wetlands will amount to approximately 9 percent of wetlands within the watershed. They provide nesting and brood habitat for 30-50 ducks during wet years. Approximately 279 acres of wildlife habitat will be converted to a maximum of 235 acres of open water with 5.75 miles of shoreline and 44 acres of riparian habitat. It will also provide a resting area for 2,100 ducks and geese.

Ninety thousand trout could be harvested annually from the reservoir. This is the base for 55,100 annual recreation visits. These visits are divided into 39,980 general recreation visits, which includes boating, camping, picnicking, hiking and swimming, valued at \$2.25 per visit, 600 goose hunters days valued at \$4.50 per visit, and 14,250 specific recreation visits for cold water trout fishing valued at \$6.50 per visit. Assistance was furnished by the Fish and Wildlife Service (USDI) in determining the

^{1/} Refer to table on page 9.

specialized values. The recreation season used was May 15-September 15, and the daily design capacity is 1,090 recreation visits per day. There will be a number of related impacts, i.e., traffic generation, refuse and litter, drinking water, sanitation, and economic. Annual water requirement of the recreation facilities (approximately 0.9 AF) will be drawn from wells 300-500 feet deep.

The base flow and temperature of the perennial flow downstream of the reservoir will not be affected. Stream gages will be installed to monitor streamflows. Annual recreation storage in the reservoir of 1,000 AF will be lost to downstream irrigation uses. Evaporation from the reservoir will cause a 3 to 4 foot drop in water elevation.

Diversion of Creston area floodwaters will impact the adjoining watershed, Sinking Creek. The headwaters of Sinking Creek will be augmented by about 35 AF of average annual runoff, diverted from the Creston area. This nominal increase will not significantly contribute to Sinking Creek peak flow. A small amount of additional water in Sinking Creek should have a positive effect on the Type 3 and Type 4 wetlands and some flowing sections of the creek.

Aesthetics of the area will be improved with the large body of water being visible to travelers along State Highway #2.

Ambient air conditions are not expected to be significantly altered by the project. During construction phases, there may be an increase in suspended particulates due to dust from blasting, grading, and hauling. This will have the greatest impact on residents in Wilbur and Creston near the channel improvement and structural sites. These residents will suffer only slight impact from construction activities at the multipurpose reservoir site.

Noise pollution will occur during construction; however, equipment used will conform to suggested standards for noise control. Residents of Wilbur and Creston will be affected more by the channel work than by the construction activity at the multipurpose reservoir site.

The dam and subsequent reservoir will force the relocation of three farmsteads. Presently, one is unoccupied and two are leased out. On the basis of current occupancy, an estimated seven persons will be displaced. None of the farmsteads or their occupants is considered low income or of a minority race.

The land treatment and structural measures planned for flood prevention purposes will prevent damages to urban properties from out of bank flooding up to 100-year storm. Out of bank flooding within Wilbur will be reduced from 158 acres to no acres for the once in a 100-year storm. The Creston area flooding will be reduced from 78 acres to no acres for the once in a 100-year storm. Flooding and sediment damage will be reduced downstream of the watershed also.

Areas within Wilbur protected by the 1 percent runoff event contain 116 residences and 93 commercial and public buildings. The Creston area protected from the 1 percent runoff event includes 19 residences and 11 commercial and public buildings.

The following tabulation presents the estimated effects of the project measures on the 1 percent and 10 percent chance flood discharges and the flood stages in Wilbur and Creston:

	Location			
	Creston		Wilbur	
<u>1 Percent Discharge</u>	<u>Flow</u>	<u>Area Inundated</u>	<u>Flow</u>	<u>Area Inundated</u>
Without Project Measures	230 cfs.	78 ac.	8,100 cfs.	158 ac.
With Project Measures	30 cfs.	0	1,720 cfs.	0
<u>10 Percent Discharge</u>				
Without Project Measures	90 cfs.	5 ac.	2,080 cfs.	30 ac.
With Project Measures	20 cfs.	0	840 cfs.	0

The 1957 flood through Wilbur was estimated at 3,700 cfs and if the completed project is subject to a similar runoff, the structural measures will reduce the flow to 1,280 cfs, without any damage to the towns of Wilbur and Creston. The 1957 flood was estimated to be a 4 percent event and the project is designed for a 1 percent event.

The project will impact staff activities of the sheriff, Department of Game, recreation district, town of Wilbur, and those others involved in operation, maintenance, and control of the spillway, reservoir, and recreation facility, including the camping and picnicking areas and sanitary facilities. The Health Department will regulate drinking water quality and the sanitary conditions of restrooms, trailer dump stations, and refuse disposal.

C. Economic and Social

Structural measures will be installed in a 4-year period. Employment needs are estimated to be 1.9 man-years of semi-skilled and 10.4 man-years of skilled labor. Land treatment measures will be installed in a 10-year period, with employment needs estimated to be 25 man-years of semi-skilled labor. The operation and maintenance job needs are expected to be absorbed by existing staffs.

Structural measures contracts may be expected to be secured with contracting firms out of the area, as there are no sizeable heavy construction equipment contractors located in the area. Some laboring and nominal skilled jobs may be filled by the local part-time labor pool of part-time farmers and youth.

Once the project is installed, annual operation and maintenance requirements are estimated to be 2 man-years of semi-skilled labor annually. There will be 5 man-years of services and trade employment annually.

The economic base will improve as monies would be spent on fuel, groceries, drinks, restaurant food, boating supplies, and fishing equipment.

The economic impact of the project will bring with it a social impact. The local area will have an influx of recreationists. Vandalism will increase. Residents may find that the quality of service provided by local businesses will be reduced.

After the reservoir has filled, the property above the project purchase boundary may become sought after as recreational/residential property. In anticipation of this, the County Planning Director has stated that the Planning Commission will consider rezoning to the Open Space Recreation Zone from the current Agricultural-Range Zone.

An added economic impact will be taxation to finance the project.

Reduction of soil and water losses due to conservation land treatment should improve farm and ranch productivity. Guarantee of substantial flood loss reduction, as a result of structural improvements, will have a favorable economic impact. Landowners would be more inclined to make property improvements, which would result in an increase of the net worth of the area.

D. Favorable Environmental Impacts

1. A slight reduction of flood runoff peaks due to land treatment.
2. An increase in ground infiltration of moisture.
3. A 30 percent decrease in average annual erosion rates and a 73 percent decrease in sediment yield, with a corresponding reduction in chemical fertilizer levels in runoff water.
4. Livestock production rate will be improved and future crop production will be protected.
5. Sediment damage will be reduced on 50 acres of cropland and 8 acres of pastureland.
6. Area downstream of the watershed will experience less sediment damage and floodings.
7. Grassed waterways and terraces will improve wildlife habitat on existing cropland.
8. A reservoir of approximately 235 acres will produce 90,000 trout annually, resulting in 14,520 fisherman days.
9. The reservoir and facilities will provide an opportunity for 39,980 general recreation visits annually.
10. The reservoir will provide resting area for approximately 2,100 ducks and geese annually, with 600 hunting days.
11. Approximately 5.75 miles of riparian habitat (44 acres) will be created by the reservoir shoreline.
12. One hundred and fourteen acres of land will be set aside for recreation development at the reservoir site.
13. Water quality downstream of the reservoir will be improved by reducing coliform counts and turbidity.
14. Diversion of water into Sinking Creek will have a positive effect on wetland and some flowing sections of the creek.
15. Approximately 158 acres, including 209 buildings, will be protected from flooding in Wilbur.
16. Approximately 78 acres, including 30 buildings, will be protected from flooding in Creston.
17. Aesthetics of the area will be improved by the land treatment measures and the reservoir.

18. Labor opportunity created by project installation will be 25 man-years for land treatment measures, 12.3 man-years for structural measures, an annual operation and maintenance need of 2 man-years, and services and trade employment of 5 man-years annually.
19. The economic base of the area will be increased.
20. Social well-being will be improved.

E. Adverse Environmental Effects

1. The multipurpose reservoir and recreation facility will alter land use on 393 acres, including the loss of production from 95 acres of pasture and hayland, 287.5 acres of rangeland, and 10.5 acres of wetland.
2. Approximately 279 acres of wildlife habitat will be lost with multipurpose reservoir installation.
3. Approximately 2.1 miles of intermittent stream channel will be inundated by the reservoir.
4. Elimination of nesting and brood habitat for 30-50 ducks.
5. Wildlife will be disturbed in the 114 acre recreation area.
6. Disturbance in the borrow area will reduce productivity on 40 acres of cropland.
7. Installation of grassed waterways and terraces will remove cropland from production.
8. The Creston project will remove approximately 27 acres of cropland from production.
9. Problems associated with traffic, refuse and litter, drinking water, and sanitation, will be created by the recreation development.
10. Limited noise pollution from motorboating on the lake.
11. There will be some noise and air pollution associated with the project construction activities.
12. Three farmsteads and an estimated seven persons will be forced to relocate.
13. One thousand AF less runoff for downstream irrigation uses.
14. The recreation pool will lower 3 to 4 feet during the summer season.
15. An increase in local taxation.
16. Small archeological site may be disturbed by influx of people to recreation facilities.

VI. ALTERNATIVES

Reasonable alternatives to the proposed project action are discussed below. Each alternative contains a brief description, goal achievement and level of protection, cost estimate and impacts that differ from the planned project.

Alternative A

Brief Description

Accelerated land treatment measures, as discussed in planned project, would be installed.

Goal Achievement and Level of Protection

Since flooding occurs on a frozen ground condition, conservation land treatment will have a minor effect on flood control in Wilbur. Therefore, the alternative would not achieve the goal of flood prevention. The goal of water-based recreation in the watershed is not achieved. The problem in Creston could be partially solved with land treatment measures installed with group action.

Cost Approximation

Conservation land treatment. \$1,626,430

Impacts

The impacts of land treatment measures will be the same. Major impacts of this alternative that would be different from the planned project are:

Downstream sedimentation reduced by 43 percent, instead of 73 percent.
Improvement in downstream water quality would be less.
Favorable benefits of the reservoir recreational facilities and other structural measures not achieved.
Adverse effects of structural measures eliminated.
No local tax increase.

Alternative B

Brief Description

Flood insurance for the town of Wilbur was considered as an alternative. Accelerated land treatment and the Creston area work would remain as in the planned project.

Under the National Flood Insurance Act of 1973, the federal government underwrites insurance policies. The insurance is made available through local private insurers. The Act requires that local governments, that have proper authority, adopt and enforce land use control measures to guide land developments in flood-prone areas in order to avoid or reduce future flood damage.

Once an application for flood insurance has been approved, subsidized premium rates are made available. These rates would remain in effect until a flood study could be made. After the flood study, new rates, depending upon flood hazard, would be in effect. Those buildings in the flood plain that were in place prior to the submission of the application would continue to be eligible for the subsidized rate.

Within 6 months after receipt of flood hazard areas, the local governing body must adopt and enforce additional land use regulations.

Floodproofing was considered but not evaluated. It was not considered a viable alternative. Many of the buildings are old and floodproofing would be quite difficult and expensive.

Cost Approximation

Average annual local cost of flood insurance for residential areas is \$4,000. Commercial flood insurance local cost is \$40,000 annually.

Land treatment costs would be \$1,626,430, and the Creston project cost would be \$85,300.

Impacts

The impacts of land treatment and the Creston area work would be the same. Major impacts of this alternative that would be different from the planned project are:

Downstream sedimentation reduced by 43 percent, instead of 73 percent.

Slight improvement in downstream water quality from land treatment effects only.

Favorable benefits of the reservoir and recreation facilities not achieved.

Adverse effects of the structural measures eliminated.

Flood plain businesses and residences relocated over a period of years causing changed land use in areas adjacent to the present community.

Threat of flooding reduced - flood insurance redistributes the cost of flooding from an event by event method to an amortized amount over the evaluation period.

Flood insurance administration cost.

Alternative C

Brief Description

Approximately 250 small dry dams would be needed to control flooding. These small dams would be built on upland, small drainage areas, usually under 300 acres in size. These dams would be 1 to 4 acres in size with flood capacity of 4 to 10 acre feet. The estimated cost of installation per structure is \$9,500 each. Accelerated land treatment and the Creston area work would remain as in the planned project.

Goal Achievement and Level of Protection

Creston and Wilbur would be protected from flooding from a 1 percent flood event. The water-based recreation would not be realized. Land treatment would be achieved.

Cost Approximation

	<u>(+250 dams)</u>
Installation (all dams).....	\$2,375,000
Creston treatment (as in planned project).....	85,300
Conservation land treatment.....	<u>1,626,430</u>
TOTAL COST.....	\$4,086,730

Impacts

The impacts of the land treatment measures will be the same. Major impacts of this alternative that would be different from the planned project are:

Sediments held nearer their source in the upper watershed.

Adverse effects of the multipurpose structure and facilities eliminated.

Beneficial effects of the multipurpose structure and facilities eliminated.

Construction activities less concentrated, hence, less noise pollution and reduced adverse impact on air quality.

Production from 30 acres of cropland eliminated by embankments.

Crop production on 750 acres of cropland reduced due to the use of these areas as flood pool and borrow areas.

Wildlife habitat developed on 30 acres.

Less improvement in economic activity and social well-being.

Less local project costs.

Fewer upstream flood damages.

Alternative D

Brief Description

Four dams would be constructed, creating reservoirs for flood retention, with 35-55 acres of land being necessary for each structure. One dam would be on Lauritzen Draw; the second dam on Goose Creek above the mouth of Sherman Creek; the third on Sage Hen Draw just above where it empties into Sherman Creek; the fourth, on Sherman Creek above Sage Hen Draw. The Creston area work and land treatment would remain as in the planned project.

Goal Achievement and Level of Protection

The goal of flood protection in the watershed would be very well achieved, not only for the community of Wilbur, but throughout the watershed. The goal of water-based recreation would not be achieved. None of the four reservoirs would be large enough to retain any useful pool of water after the floodwaters have been passed. The depth and amount of water would not be conducive to any recreation, including fishing. The conservation land treatment goals would be achieved.

Cost Approximation

Four dams (total cost all 4 dams).....	\$1,200,800
Creston treatment (as in planned project).....	85,300
Conservation land treatment.....	<u>1,626,430</u>
TOTAL COST.....	\$2,912,530

Impacts

Impacts of land treatment and the Creston area work would be the same. Major impacts of this alternative that would be different from the planned project are:

Wildlife cover altered on approximately 80 acres (sediment pools).

Approximately 1.5 miles of intermittent natural channel disturbed.

No wetlands inundated.

Creation of nesting and brood habitat for 80-100 ducks.

Fishery would be incidental - no stocking would take place.

Aesthetically less pleasing to users of U.S. Highway #2.

Most of the impacts associated with recreation development eliminated.

Incidental recreation causing minor disturbance to wildlife.

Fewer social problems associated with recreation.

No relocations.

Reduced production from 180 acres of cropland, pastureland, and hayland.

Less labor opportunity, induced economic activity, and social well-being.

Alternative E

Brief Description

Involved in this alternative would be a major flood prevention/recreation dam on Goose Creek between Wilbur and the mouth of Sherman Creek (as in the planned project); a 38-foot dam on Lauritzen Draw to impound water in a reservoir of approximately 35 acres surface area; accelerated conservation land treatment, and work in the Creston area.

Goal Achievement and Level of Protection

All project goals are achieved with this alternative. The flood prevention/recreation dam on Goose Creek accomplishes identically what the planned project accomplishes. The smaller flood dam on Lauritzen Draw effectively stops any runoff from that source which might otherwise lead into Wilbur. The limited channel work in Wilbur will be eliminated. The land treatment measures and the work at Creston achieve the same level of effectiveness as in the planned project.

Cost Approximation

Reservoir and related costs.....	\$1,951,600
Recreation facility.....	242,100
Flood control dam in Lauritzen Draw.....	300,190
Creston treatment (as in planned project).....	85,300
Conservation land treatment.....	<u>1,626,430</u>
TOTAL COST.....	\$4,205,620

Impacts

Impacts of land treatment, Creston area work, and the multipurpose structure and recreation facilities would be the same as in the planned project. The added structure on Lauritzen Draw would have the following impacts:

Impacts of the planned project work on the Wilbur channel eliminated.

An additional 5 percent decrease in downstream sediment yield, plus improved water quality.

Provide additional resting area for 200 ducks and geese annually.

An additional 0.5 mile of intermittent riparian habitat created by small reservoir.

Productivity reduced on 10 acres additional borrow areas.

Loss of production on 20 acres committed to reservoir.

Twenty acres wheatland habitat converted to shallow water lake.

A 0.25 mile increase in intermittent stream channel inundated by reservoirs.

Increase in annual evaporated losses from reservoirs.

Additional fuel, man-made materials and natural resources committed.

More noise and air pollution.

Additional labor opportunity created.

More taxation.

Creston Alternative

Brief Description

The planned work for Creston could be replaced with channel work through town. Beginning at "F" Street, the open ditch south of the railroad tracks would be improved westward for approximately 3,000 feet until it joins the improved ditch currently running westward and lying between the railroad tracks and State Highway 2. This latter ditch would be replaced with 2,000 feet of 30-inch concrete pipe from "F" Street westward. After the pipe, an improved ditch would run westward until joining the smaller southerly ditch. The combined ditch would pass under the highway, west of the grain elevators, and proceed northwest toward Goose Creek. The total open ditch work would amount to about 6,000 lineal feet.

Goal Achievement and Level of Protection

The goal to provide a once in a 100-year level of protection for the Creston area would be achieved.

Cost Approximation

Complete channel work.....\$114,200

Impacts

Impacts of this alternative would be the same as those of the proposed project, except for the following:

Spring runoff peak flows in Goose Creek downstream of Creston increased slightly.

Approximately 0.8 miles of intermittent man-made channel and associated plant and animal habitat disturbed, with 0.4 miles destroyed.

Construction would take place within the town: impact of noise pollution, and air quality greater than under other alternatives.

All impacts associated with the planned floodwater diversions, and structures eliminated.

Traffic flow on State Highway 2 disturbed during installation of the pipe.

Alternative F

Brief Description

A no project alternative would eliminate all the work proposed in the planned project. The ongoing land treatment program would continue, but would not be accelerated.

Goal Achievement and Level of Protection

None of the identified goals would be achieved. The continuation of the present land treatment program would do little to reduce the erosion and sediment presently occurring in the watershed. Land use would change very little if the project were installed.

Cost Approximation

The estimated net monetary benefits that would be foregone by not implementing the project are \$187,490.

Impacts

All impacts of the planned project would be eliminated, both favorable and adverse.

VII. SHORT - TERM VS. LONG - TERM USE OF RESOURCES

The minor land use modifications resulting from the four major aspects of this project are not in conflict with or in violation of trends, formal land use plans, regional plans, river basin plans and the expected future land use of the watershed. The project is in conformance with plans and policies of those persons and agencies whose responsibilities and jurisdictions include the watershed.

The conservation land treatment will extend the life and productivity of the soil resources. The conservation practices will also improve the water quality and increase the wildlife habitat.

The project is designed to reduce flooding, create recreation opportunities, and reduce erosion and sedimentation for a period of 100 years. With proper operation, maintenance, and replacement, the project will last the full 100 years and longer. The flood protection provided could be extended an additional 200 years if recreation storage is sacrificed.

Benefits to fish and wildlife and recreation brought about by the project should accrue to present and future generations alike. These benefits will be both local and regional in nature, because people from outside the watershed will make use of the area. Benefits from flood prevention will be more of a local nature, although small impacts from reduced flooding will be felt downstream of the project.

The Goose Creek Watershed lies in the Upper Columbia subregion 1709 of the Columbia-North Pacific Water Resource Region as designated by the Water Resource Council. The 1970 Washington Soil and Water Conservation Needs Inventory lists 47 feasible P.L. 566 projects in the subregion. Of these 47 watersheds, none are built, none are under construction, and Goose Creek is the only one in the planning stage. However, applications for seven 566 projects have been prepared.

VIII. IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

The major irreversible and irretrievable land commitment is the land associated with the dam and recreation facility. Of the 480 acres to be permanently committed to the project, 100 are pasture and haylands, 15.1 are wetlands, and 364.9 are rangelands. After project completion, 279 acres will be committed to the dam and the recreation pool, 87 additional acres to the flood pool, and 114 acres to the recreational facility.

Removal of the impounded water would allow the land (reservoir bottom) to be reclaimed for a usage similar to what now exists. Only the 45 acres under the dam would remain unavailable to feasible reclamation.

The 37.0 acres of permanent land rights for the Wilbur channel and Creston project will be committed for the life of the project.

Labor, fuel for construction equipment, federal, state, and local dollars, local natural materials, and various man-made products will all be committed to the numerous aspects of the project, including land treatment.

IX. CONSULTATION AND REVIEW WITH APPROPRIATE AGENCIES AND OTHERS

On November 16, 1966, an open public meeting sponsored by Northwest Lincoln County Soil and Water Conservation District was held to acquaint the public with the possibilities of a watershed project near Wilbur. On December 5, 1966, an open public meeting sponsored by Odessa and Wilson Creek Soil and Water Conservation District was held. Invited were the State Division of Water Resources, Army Corps of Engineer's Office and Bureau of Reclamation, to review any of their plans which may affect the resources of the area.

The town of Wilbur and the Northwest Lincoln County Soil and Water Conservation District submitted an application for P.L. 83-566 assistance. It was received and approved by the Soil Conservation Service on July 27, 1967.

On September 19, 1967, the town of Wilbur's attorney took the position that the city could participate in a watershed project outside the municipal limits. On June 2, 1969, Goose Creek Watershed received priority number 21.1/ On February 10, 1972, the Wilbur Register printed an information leaflet and requested public participation in determining alternatives. A public meeting was also held on this date with the various public agencies invited to participate. Fifty specific opinions were registered: 41 individuals and the town of Creston favored an alternative featuring flood control and recreation; two individuals and the town of Creston found a "flood control only" project would be acceptable to them; two persons favored several small dams instead of the single structure; one person felt that a flood control recreation dam with some control on Railroad Draw would be the better alternative; and four individuals favored doing nothing if it involved more government and higher taxes.

On June 21, 1972, the Soil Conservation Service Administrator authorized work to develop the Watershed Work Plan. In July, 1972, a public announcement to proceed with the planned project as the accepted alternative of the project sponsors was circulated. In early 1973, a steering committee was organized, meeting every other week during the winter. Inputs were requested and received from other agencies and the Soil Conservation Service presented progress reports at 1973 and 1974 meetings.

Information from the State Department of Natural Resources, State Department of Game, and the U.S. Fish and Wildlife Service have been included in the plan.

1/ Priority number assigned to project by Washington State Department of Ecology.

The project sponsors have worked directly with the Lincoln County Conservation District. Other state and federal agencies consulted include United States Fish and Wildlife Service of the Department of Interior, Washington Department of Game, United States Bureau of Reclamation and Washington State Parks and Recreation Commission.

The Soil Conservation Service has contacted the following, through it's environmental impact statement consultant, Haworth and Anderson, Inc., of Spokane, Washington:

National Park Service, Department of the Interior
The Washington State Office of Program Planning and Fiscal Management
Office of Community Development
Department of Ecology
Department of Game
Department of Natural Resources
Parks and Recreation Commission
Advisory Council on Historic Preservation, State Historic
Preservation Officer 1/
Lincoln County, Washington - Planning Department
Lincoln County, Washington - Health Department
Lincoln County Historical Society
Archaeology Research Associates - Washington State University 1/

The National Register of Historic Places has been reviewed, and the State Historic Preservation Officer was consulted along with others, as shown in Appendix F. The Soil Conservation Service has complied with Section 106, PL-89-665, and Executive Order 11593.

Continued coverage of the project developments has been provided by the Wilbur Register and the Board of the Lincoln County Conservation District. A record of same is on file in the Soil Conservation Service office and in the file of the Wilbur Register.

1/ See Appendix F, for correspondence on archeological and historic resources.

Comments on the Draft Environmental Impact Statement were requested from the following agencies and private organizations:

U.S. Department of the Army
U.S. Department of Commerce
U.S. Department of Health, Education, and Welfare
U.S. Department of the Interior
U.S. Department of Transportation
Environmental Protection Agency
Advisory Council on Historic Preservation
Washington State Department of Ecology (for Governor)
Washington Department of Game
Washington Department of Planning and Community Affairs
Washington Environmental Council
Washington State Parks and Recreation Commission
Office of Program Planning and Fiscal Management (State Clearinghouse)
Grant, Lincoln, Adams Council of Governments (local A-95 Clearinghouse)
Natural Resources Defense Council
Friends of the Earth
Environmental Defense Fund
National Wildlife Federation
National Audubon Society
Environmental Impact Assessment Project
Washington Sportsman's Council

Comments were received from the following:

U.S. Department of the Interior
U.S. Department of Transportation
Environmental Protection Agency
Advisory Council on Historic Preservation
Washington State Department of Ecology
Office of Community Development (State Clearinghouse)
Washington Department of Game
Washington State Highway Commission
Washington State Parks and Recreation Commission
Grant, Lincoln, Adams County, Conference of Governments
Friends of the Earth, Inc.
U.S. Department of the Army

Summary of Comments and Responses

Each issue, problem or objection is summarized and a response given on the following pages. Comments are serially numbered where multiple comments were supplied. The original letters of comment appear at the end of the statement in Appendix D.

U.S. Department of Transportation

Comment: The draft EIS does not indicate if the State Route 2 (FAP-028-3) bridge in Wilbur will be affected by the proposed channel change.

Response: The channel work described in the plan will begin downstream of this bridge and will not impact the bridge or traffic on the highway.

Advisory Council on Historic Preservation

1. Comment: The Advisory Council notes that the undertaking will affect an archeological site, a property which will be nominated to the National Register of Historic Places.

Response: The archeological site will be on private property and not in the construction or public access area of the project. It will be over two-thirds mile from the developed public recreation area and will not be impacted by the planned project.

2. Comment: Pursuant to Executive Order 11593, "Protection and Enhancement of the Cultural Environment," of May 13, 1971 as implemented by the Advisory Council's "Procedures for the Protection of Historic and Cultural Properties," (36 C.F.R. Part 800), Federal agencies must, prior to the approval of the expenditures of any undertaking or prior to the granting of any license, permit or other approval for an undertaking, afford the Advisory Council an opportunity to comment on the effect of the undertaking upon properties eligible for listing in the National Register of Historic Places.

The Advisory Council notes on pages F-1 and F-2 of the draft environmental statement that Dr. Harvey S. Rice of the Washington Archaeological Research Center at Washington State University has expressed concern over the impacts of the near-by reservoir and its proposed recreational development on this archeological resource which appears to be eligible for inclusion in the National Register of Historic Places.

Response: The Soil Conservation Service does afford the Advisory Council a reasonable opportunity to comment on the undertakings as required by Section 106 of the Historic Preservation Act of 1966 (16 U.S.C. 470f). However, it is the opinion of the U.S. Department of Agriculture that the Advisory Council's "Procedures for the Protection of Historic and Cultural Properties," (36 C.F.R. Part 800), are not in accord with the requirements of Section 1(3) of Executive Order 11593 and Section 106 of the Historic Preservation Act of 1966 relative to federal and financial assistance on nonfederally owned lands. The archeological resources you referred to occur: (1) on private land; (2) outside of the construction area; and (3) where we believe there are no measurable adverse affects from project action. Therefore, it is our opinion that no further action is required with regard to the 36 C.F.R. 800 procedures.

Washington State Department of Ecology

1. Comment: The document should indicate what provisions would be made if the towns of Wilbur and Creston failed in their operation and maintenance responsibilities.

- Response: The operation and maintenance agreement, signed by SCS and the sponsors, is a binding document and any failure of responsibilities can be enforced through due legal process.
2. Comment: It should be mentioned that Department of Ecology permits (Dam and Reservoir, as well as Water Rights) would be required.
- Response: Concur. A statement has been added to the planned project section regarding compliance with all local, state and federal laws.
3. Comment: Of the 209 buildings to be protected in Wilbur, the percentage falling into various categories should be shown.
- Response: The environmental impact section shows 116 residences and 93 commercial and public buildings.
4. Comment: The document should address how recent administrative budget considerations will affect the SCS commitment to land treatment.
- Response: SCS would be committed to furnish technical assistance to the watershed. Past performance has shown that the application of land treatment is slowed very little when cost sharing is not available.

Washington State Highway Commission

- Comment: It would be appropriate for the SCS to meet informally with our Spokane District to discuss their proposed recreational area access road connection to State Route 2.
- Response: Concur. This will be done before detailed final design is started.

Washington Department of Game

- Comment: Adverse and positive effects would be sustained on wildlife resources if the proposed project is implemented as acknowledged (pages II-69 through II-72). At the same time, we stress that realization of the wildlife benefits outlined depends (in part) on landowner compliance with objectives of the plan. Compliance is not compulsory. The benefits outlined are reasonable and obtainable if the landowners so wish.
- Response: None.

Washington State Parks and Recreation Commission

- Comment: We can find no adverse impact on existing or proposed recreational areas or other areas of responsibility under the jurisdiction of the Commission.

Response: None - Note. This letter signed by Chief, Environmental Coordination and by the State Historic Preservation Officer.

Office of Community Development (State Clearinghouse)

Comment: We have no comments on the project.

Grant-Lincoln-Adams County Conference of Governments (local A-95 Clearinghouse)

Lincoln County Health Department

Comment: The Creston swamp abatement is not clear in that the water draining into the swamp will be diverted, but there is no actual plan to drain the swamp. As long as such mosquito breeding areas exist adjacent to a concentration of people, there is a real danger of infecting humans with mosquito-borne diseases.

Response: The Soil Conservation Service policy states that we cannot provide technical and financial assistance for draining or otherwise altering wetlands Type 3 through 20 in order to convert them to other land uses. The wetland area at Creston has been classified Type 3 by applying criteria in U.S. Fish and Wildlife Circular #39.

Lincoln County Commissioners

Comment: We are not prepared to take a stand either for or against this project at this time.

Friends of the Earth, Inc.

1. Comment: While recognizing the damage that floods can inflict upon businesses and residences in a flood plain, we feel that structural measures cause even more development in normally unsuitable areas. Flood prone areas should be respected for what they are: Areas prone to Flooding!! For this reason, we strongly recommend implementation of Alternative B which is the only alternative that would guide land developments in flood-prone areas in order to avoid or reduce future flood damage.

Response: The town of Wilbur is a small, older rural community with a population of approximately 1,140. The flood plain has been developed for many years and growth of the community is static to possibly a slight downtrend. The town applied and became eligible for flood insurance in May, 1975 and are presently under the emergency program. The Service firmly believes, in general, with your comments but do not feel that a nonstructural solution by itself would be reasonable in this area.

2. Comment: Summary - Page II-2:

Change Section E to read: "Land use will be altered. . .with creation of a 235-acre reservoir. . .

Response: Concur. The statement has been changed to include the comment.

3. Comment: Structural Measures - Page II-10:

What percentage of the total capacity will be in sediment storage?

Response: Sediment storage will be 16.5 percent of the total capacity of the reservoir.

4. Comment: Recreation Problems - Page II-55:

It states, "Some of the present recreational facilities are over utilized (at Lake Roosevelt) during peak summer months". This is not borne out by the succeeding statements that Lake Roosevelt has not proven to be a good fishery, it discourages many would-be bathers and debris presents a hazard for boaters. It would appear from this that recreational opportunities have not panned out at Lake Roosevelt. Can we be sure that the recreational benefits of the Goose Creek Reservoir, (which the Cost-Benefit Analysis in Appendix A shows as the sole reason it exceeds 1:1) have not been optimistically overestimated? Why would the reservoir make a good fishery where Lake Roosevelt does not?

Response: Existing recreational facilities on Lake Roosevelt are heavily utilized because these facilities are relatively few in number (approximately 20 developed sites) on a relatively large reservoir (approximately 150 miles long). The developed facilities on Lake Roosevelt are insufficient to meet the demand within the market area; hence, heavy utilization of these existing facilities - and a need for additional water-based recreation developments, such as Goose Creek reservoir.

Goose Creek reservoir will provide a better sport fishery than Lake Roosevelt (per unit of area) because fish will be largely provided on a put-and-take basis by the Game Department. The reservoir will also be much smaller than Lake Roosevelt and infinitely easier for the Game Department to stock and manage.

5. Comment: A. Conservation Land Treatment - Page II-60:

It states, "The combined effects of land treatment measures on cropland will reduce the annual soil loss from approximately 7 tons per acre to within allowable limits".

Executive Order 11514 Protection and Enhancement of Environmental Quality, Section 2 (a) directs the heads of federal agencies to "monitor, evaluate, and control on a continuing basis their agencies activities so as to protect and enhance the quality of the environment". (Emphasis ours) Nowhere in this plan, contrary to Executive Order 11514, is any mention made of a mechanism for monitoring, evaluation, or control.

Response: It has been determined that monitoring would not be an essential part of the project. Water quality baseline conditions have been established with the data shown in Appendix G and the added section on water quality problems.

Land treatment effects have been studied, observed, and monitored for many years, and additional studies on this project would gain little for the expenses involved.

6. Comment: Favorable Environmental Impacts:

Sediment deposition will be reduced on 50 acres of cropland and 8 acres of pastureland downstream of the watershed. Is this a favorable impact? Doesn't deposition of suspended sediment loads add to the fertility of the soil?

Response: Where analysis has been made of the nutrient levels and organic matter in newly deposited sediments, the data shows that the fresh sediment does not generally add to the fertility of the soil, but in contrast has a negative impact. Changes have been made to show reduction of sediment damage instead of sediment deposition as a favorable impact.

7. Comment: Change Item 10 on Page II-69:

to read, "The reservoir will provide resting area for approximately 2,100 ducks and geese annually, with 600 hunting days".

Response: Concur. Items 8 and 10 under "Favorable Impacts" have been changed to "reservoir" instead of "lake".

8. Comment: Items 15-16:

According to these figures, 393 acres will be lost for productive use in order to protect 236 acres of land in Wilbur and Creston. In view of our shrinking agricultural base, this trade-off does not appear justifiable.

Response: Approximately 287.5 acres of rangeland in poor to fair condition is included in the land use change. Approximately 90,000 trout annually is very good productive use of an area presently with very little production.

9. Comment: VII. Short-Term vs. Long-Term Use of Resources - Page II-82:
In view of the increasing need for Energy Conservation, we ask that Energy be included as a factor in this section. (By this we mean the Energy foregone in construction and implementation of this plan).

Response: Section VIII of the EIS discusses labor, fuel, natural materials, and various man-made products that will be committed to the project.

U.S. Department of Interior

1. Comment: It is stated that while Lincoln County and the towns of Creston and Wilbur have no comprehensive land use plan, there is a general county-wide zoning ordinance, which is not further described. Of interest in relation to the project would be any provisions concerning developments in flood-prone areas or the lack of such provisions. The possibility that future developments in the areas benefited by the project could lead again to a rise in future flood damages, should be discussed.

Response: Lincoln County has signed up for the National Flood Insurance Program, and County Ordinances have been developed to comply with provisions of the program. The town of Wilbur applied, and became eligible for flood insurance in May 1975, and are presently under the emergency program.

2. Comment: Page II-25, last paragraph: We suggest that the sentence reading "This same basalt limits the mineral content of the area" be revised to read "The thickness of the basalt flows probably preclude the existence of metallic minerals in the area".

Response: Concur. The statement has been changed to include the comment.

3. Comment: Page II-44, and F-1: The final environmental statement should expand the discussion on the archeological site near the proposed dam. The status of compliance procedures for protecting cultural resources and possibilities for mitigating impacts should be integral parts of this discussion.

Response: See Response 1 and 2 from Advisory Council on Historic Preservation comments.

4. Comment: Page II-58, second paragraph from bottom: Delete cubic yards and substitute tons, and add the sentence "Mining and reclamation plans must be submitted and approved before mining permits will be issued".

Response: Concur. The statement has been changed to include the comment.

5. Comment: The environmental statement should evaluate impacts of structural measures on groundwater levels and recharge, and should consider the possibility of impacts on quality of groundwater.

Response: The proposed dam would be founded on basalt bedrock as the unconsolidated alluvial sediments will be removed from an area comprising the base width of the dam. The alluvial sediments consists mainly of slowly permeable materials, but will be replaced entirely with impermeable material. The construction of the dam would, therefore, retard the normal flow of groundwater through the valley alluvium and, consequently, lower the groundwater levels. This effect on the groundwater would be restricted to the valley flood plain and there would be no effect on the deeper basalt aquifer.

It is not expected that any impact will occur to the water quality of the deep basalt aquifer by downward migration of reservoir waters. This belief is based on the massiveness of the basalt flows within the ponded area which would produce a relatively water-tight reservoir.

U.S. Environmental Protection Agency

Comment: The draft plan and statement cover quite adequately the actions planned and impacts expected from the project. The expected changes and improvements, however, are not quantified. To be meaningful therefore, we request with respect to water quality, that a discussion of affected parameters be included in the final EIS, along with their significance relative to water quality standards and stream uses. We request also, for evaluation purposes, that the project include that basic elements of the Soil Conservation Service's water quality monitoring program for the watershed.

Response: Concur. A water quality problems section has been added that describes those parameters exceeding standards for Class B waters, as described in Appendix G. Also, see response from Comment 5, Friends of the Earth.

U.S. Department of the Army

Comment: We feel that the nonstructural alternatives for reducing urban flood damages should have been more thoroughly discussed. alternative B cites flood insurance and land use regulations as alternatives but does not evaluate them. Land use regulations should be evaluated, particularly in conjunction with relocations and flood proofing.

Response: See response 1 from Friends of the Earth, Inc. comments. Section VI, Alternative B, page II-54 discusses why the alternative was not evaluated.

X. LIST OF APPENDIXES

- APPENDIX A - Comparison of Benefits and Costs for Structural Measures
- APPENDIX B - Project Map
- APPENDIX C - Letters of Comment Received on the Draft Environmental Impact Statement
- APPENDIX D - Conservation Land Treatment Measures Applicable to Goose Creek Watershed, Lincoln County, Washington
- APPENDIX E - Selected Definitions of Wetland Types from "Wetlands of the United States".
- APPENDIX F - Communications Regarding the Possibilities of Historical or Archaeological Sites in Goose Creek Watershed, Lincoln County, Washington
- APPENDIX G - Water Quality Standard and Water Quality Tests
- APPENDIX H - Preliminary Engineering Drawings

XI. S I G N A T U R E B L O C K

Approved by Galen A. Bandy Date 5/13/74
State Conservationist
Soil Conservation Service

APPENDIX A

COMPARISON OF BENEFITS AND COSTS FOR STRUCTURAL MEASURES

Goose Creek Watershed, Washington

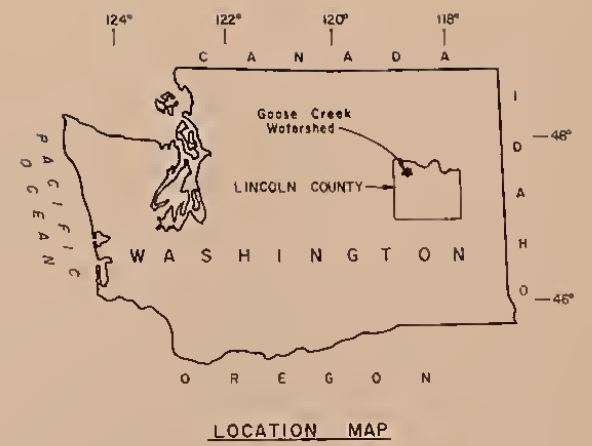
(dollars)

Evaluation Unit	Average Annual Benefits <u>1/</u>				Average Annual Cost	Benefit Cost Ratio
	Damage Reduction	Recreation	Secondary	Total		
Creston Diversion	16,870		1,450	18,320	5,400	3.4
All other Structural Measures	145,130	187,100	8,250	340,480	149,410	2.3:1
Project Admin.					16,500	
GRAND TOTAL	<u>2/</u> 162,000	187,100	9,700	358,800	171,310	2.1:1

1/ Price base: 1974

2/ Land treatment measures will not provide measurable flood damage reduction benefits.

Date November 1975



- LEGEND**
- TOWNSHIP OR RANGE LINES
 - 36 SECTION LINE AND NUMBER
 - (21) 2 IMPROVED ROAD FEDERAL AND STATE
 - IMPROVED ROAD
 - GRAVEL ROAD
 - STREAMS
 - WATERSHED BOUNDARY
 - MULTIPLE PURPOSE STRUCTURE
 - RECREATION AREA DEVELOPMENT
 - D.A. 43 SQ.MILE DRAINAGE AREA ABOVE STRUCTURE
 - DRAINAGE AREA CONTROLLED BY STRUCTURE
 - BENEFITED AREA
 - CHANNEL IMPROVEMENT
 - CONTROL STRUCTURE

PROJECT MAP
GOOSE CREEK WATERSHED
LINCOLN COUNTY, WASHINGTON

0 1 2 3 MILES
 SCALE 1:126,720

APPENDIX C

Letters of comment received on the Goose Creek Watershed Draft
Environmental Impact Statement.



United States Department of the Interior

OFFICE OF THE SECRETARY
WASHINGTON, D.C. 20240

PEP ER-75/1211

MAR 3 1976

Dear Mr. Bridge:

Thank you for the letter of December 12, 1975, requesting our views and comments on the draft environmental impact statement and work plan for Goose Creek Watershed, Lincoln County, Washington. We have reviewed the documents and conclude that they adequately consider those areas within our jurisdiction and expertise, except for several suggestions offered below.

It is stated that while Lincoln County and the towns of Creston and Wilbur have no comprehensive land use plan, there is a general countywide zoning ordinance, which is not further described. Of interest in relation to the project would be any provisions concerning developments in flood-prone areas or the lack of such provisions. The possibility that future developments in the areas benefitted by the project could lead again to a rise in future flood damages should be discussed.

The environmental statement should evaluate impacts of structural measures on groundwater levels and recharge, and should consider the possibility of impacts on quality of groundwater.

Page II-25, last paragraph: We suggest that the sentence reading "This same basalt limits the mineral content of the area" be revised to read "The thickness of the basalt flows probably preclude the existence of metallic minerals in the area."

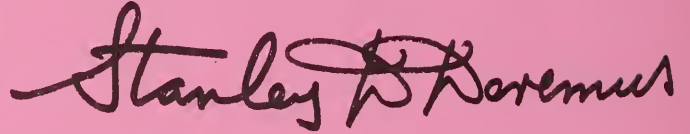
Page II-44, and F-1: The final environmental statement should expand the discussion on the archeological site near the proposed dam. The status of compliance procedures for protecting cultural resources and possibilities for mitigating impacts should be integral parts of this discussion.

Page II-58, second paragraph from bottom: Delete cubic yards and substitute tons, and add the sentence "Mining and reclamation plans must be submitted and approved before mining permits will be issued."



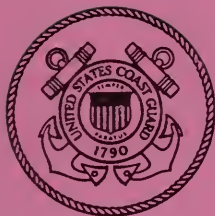
We hope these comments will be of assistance to you in the preparation of the final statement.

Sincerely yours,

A handwritten signature in dark ink, reading "Stanley B. Doremus". The signature is fluid and cursive, with the first name "Stanley" being the most prominent.

Acting
Assistant Secretary of the Interior

Mr. Galen S. Bridge
State Conservationist
Soil Conservation Service
Department of Agriculture
Room 360, U.S. Courthouse
Spokane, Washington 99201



DEPARTMENT OF TRANSPORTATION
UNITED STATES COAST GUARD

TITURNBORG

MAILING ADDRESS:
U.S. COAST GUARD (G-WS/73)
400 SEVENTH STREET SW.
WASHINGTON, D.C. 20590
PHONE: (202) 426-2262

Mr. Galen S. Bridge
State Conservationist
Soil Conservation Service
U. S. Courthouse
Spokane, Washington 99201

Dear Mr. Bridge:

This is in response to your letter of 12 December 1975 addressed to DOT Water Resources Coordinator concerning a draft environmental impact statement for the Goose Creek Watershed, Lincoln County, Washington.

The concerned operating administrations and staff of the Department of Transportation have reviewed the material submitted. The Federal Highway Administration had the following comments to offer:

"The draft environmental impact statement does not indicate if the State Route 2 (FAP -028-3) bridge in Wilbur will be affected by the proposed channel change. If it is, modifications should be coordinated with the Washington Department of Highways. Also, traffic control on SR-2 should be coordinated during construction of the channel."

We have no other comments to make nor do we have any objection to this project. The final statement, however, should address the concern of the Federal Highway Administration.

The opportunity to review this draft statement is appreciated.

Sincerely,

U.S. ENVIRONMENTAL PROTECTION AGENCY

REGION X

1200 SIXTH AVENUE
SEATTLE, WASHINGTON 98101



REPLY TO
ATTN OF:

10FA- M/S 623

February 5, 1976

State Conservationist	1
Asst. Conserv. Operations	
Asst. Conserv. District	514
Resource Management	
Soil Scientist	
Conservation Engineer	
Administrative Services	
RB Planning Policy Leader	11-4
WS Planning Policy Leader	
Public Information Officer	
Director	

Mr. Galen S. Bridge
State Conservationist
U.S. Department of Agriculture
Soil Conservation Service
Room 360, U.S. Courthouse
Spokane, Washington 99201

Dear Mr. Bridge:

We have completed review of the Draft Plan and Draft Environmental Impact Statement prepared by Lincoln County Conservation District et al for Goose Creek Watershed, Lincoln County, Washington.

The draft plan and statement cover quite adequately the actions planned and impacts expected from the project. The expected changes and improvements however are not quantified. To be meaningful therefore, we request with respect to water quality, that a discussion of affected parameters be included in the final EIS along with their significance relative to water quality standards and stream uses. We request also for evaluation purposes that the project include that basic elements of the Soil Conservation Service's water quality monitoring program for the watershed.

Our comments on this draft environmental impact statement have been classified LO-2, LO (Lack of Objections) 2 (Insufficient Information). The classification of the Environmental Protection Agency's comments will be published in the Federal Register in accordance with our responsibility to inform the public of our views on proposed Federal actions under Section 309 of the Clean Air Act.

Thank you for the opportunity to comment on this draft environmental impact statement.

Sincerely yours,

Walter D. Jaspers

Walter D. Jaspers
Director
Office of Federal Affairs

Advisory Council
On Historic Preservation

1522 K Street N.W.
Washington, D.C. 20005

____ State Conservationist
____ Asst. Conserv. Officer
____ Asst. Conserv. Officer SNT
____ Resource Management
____ Soil Conservation
____ Construction
____ Administration
____ RB Planning
____ 2 WS Planning
____ Public Information Officer

February 10, 1976

Mr. Galen S. Bridge
State Conservationist
Soil Conservation Service
U. S. Department of Agriculture
Room 360
U. S. Courthouse
Spokane, Washington 99201

Dear Mr. Bridge:

This is in response to your request of December 12, 1975 for comments on the draft environmental statement for Goose Creek Watershed Project, Wilber and Creston vicinity, Lincoln County, Washington. The Advisory Council has reviewed the statement and notes that the undertaking will affect an archeological site, a property which will be nominated to the National Register of Historic Places.

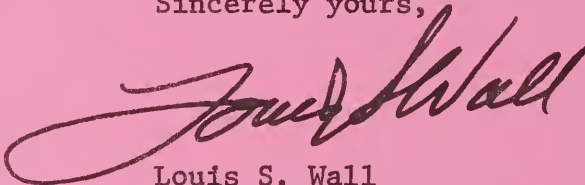
Pursuant to Executive Order 11593, "Protection and Enhancement of the Cultural Environment" of May 13, 1971, as implemented by the Advisory Council's "Procedures for the Protection of Historic and Cultural Properties" (36 C.F.R. Part 800), Federal agencies must, prior to the approval of the expenditure of any Federal funds on an undertaking or prior to the granting of any license, permit or other approval for an undertaking, afford the Advisory Council an opportunity to comment on the effect of the undertaking upon properties eligible for listing in the National Register of Historic Places. For your convenience, a copy of the Council's Procedures for compliance with Executive Order 11593 is enclosed.

The Advisory Council notes on pages F-1 and F-2 of the draft environmental statement that Dr. Harvey S. Rice of the Washington Archaeological Research Center at Washington State University has expressed concern over the impacts of the nearby reservoir and its proposed recreational development on this archeological resource which appears to be eligible for inclusion in the National Register of Historic Places. Until the requirements of Executive Order 11593 are adequately met by the Soil Conservation Service, the Council considers the draft environmental statement to be incomplete in its treatment of this archeological resource. To remedy this deficiency, the Council will provide substantive comments on the

Page 2
February 9, 1976
Mr. Galen S. Bridge
Goose Creek Watershed Project

undertaking's effect on the previously mentioned property through the steps detailed in the Council's Procedures. Please contact Brit Allan Storey of the Advisory Council staff to assist you in completing this process as expeditiously as possible.

Sincerely yours,

A handwritten signature in dark ink, appearing to read "Louis S. Wall". The signature is fluid and cursive, with a large, sweeping initial "L" and "S".


Louis S. Wall
Assistant Director, Office
of Review and Compliance

Enclosure

February 10, 1976

Galen S. Bridge
State Conservationist
U.S.D.A. Soil Conservation Service
Room 360, U. S. Courthouse
Spokane, Washington 99201

Asst. Dir.	
Asst. Dir.	
Asst. Dir.	
Resource	
Soil Science	
Conservation	
Administration	
RB Planning	
2/ WS Planning	
Public Information	



SUBJECT: Draft Plan and Draft EIS--Goose Creek Watershed

Dear Mr. Bridge:

As requested in your December 12th letter, the Department has coordinated a review of these documents in keeping with its responsibilities as state P.L. 566 coordinator. The Office of Community Development, the Parks and Recreation Commission, and the Departments of Highways, Fisheries, Game and Natural Resources were contacted. Responses were received from Parks and Recreation and the Departments of Highways and Game. These comments are attached.

In addition, the following comments are offered:

1. The documents should indicate what provisions would be made if the towns of Wilbur and Creston failed in their operation and maintenance responsibilities.
2. It should be mentioned that Department of Ecology permits (Dam and Reservoir, as well as Water Rights) would be required.
3. Of the 209 buildings to be protected in Wilbur, the percentage falling into various categories should be shown.
4. The documents should address how recent administrative budget considerations will affect the SCS commitment to land treatment.

Thank you for the opportunity to review these documents. If you wish to discuss these matters further, please contact Mr. Gene Wallace at (206) 753-2829.

Sincerely,


T. L. ELWELL
Environmental Review

TLE:cls

cc: Gene Wallace
George Krill
Charles R. Morris, OCD
William A. Bulley, Highways
Ralph Larson, Dept. of Game

Donald Moos, Fisheries
Bert Cole, DNR
Charles Odegard, Parks
and Recreation

Enclosures (3)

HIGHWAY COMMISSION

DEPARTMENT OF HIGHWAYS

Highway Administration Building
Olympia, Washington 98504 (206) 753-6005



W. A. Bulley - Director

February 5, 1976

Mr. Gene Wallace, Supervisor
Department of Ecology
Water Resources Management Division
Lacey, Washington 98504

U. S. Soil Conservation Service
Goose Creek Watershed
Draft Environmental Statement

Dear Mr. Wallace:

The Department of Highways has reviewed the subject document and finds that the project will have no short or long term adverse impacts on State highways in the area.

It would be appropriate for the Soil Conservation Service to meet informally with our Spokane District to discuss their proposed recreational area access road connection to SR 2. An access permit will be required from the Department. Coordination of this effort should be through Mr. W. R. Horning, District Engineer, N. 2714 Mayfair St., Spokane, Washington 99205; phone 456-3030.

Thank you for the opportunity to review this information.

Sincerely,

H. R. GOFF
Assistant Director for
Planning, Research and State Aid

Russell Albert
By: RUSSELL ALBERT
Planning Engineer

HRG:eh
RA/RBD

cc: W. R. Horning

DEPARTMENT OF GAME



Claude Perkins, Seattle, Chairman
Glenn Galbraith, Wellpinit
Frank L. Cassidy, Jr., Vancouver
Arthur S. Coffin, Yakima
Elizabeth W. Meadowcroft, Tacoma
Archie U. Mills, Wenatchee

Director / Carl N. Crouse

Assistant Directors / Ralph W. Larson
Jack S. Waisland

0 North Capitol Way / Olympia, Washington 98504

January 29, 1976

Mr. Gene Wallace, Supervisor
Water Resources Management Division
Department of Ecology
St. Martin's College
Lacey, WA. 98504

Attention: Mike Mills - OPP&FM

Dear Mr. Wallace:

The draft environmental impact statement--Goose Creek Watershed Project, P.L. 566, Lincoln County--was reviewed by our staff as requested. Comments follow.

As you may know, our regional staff has participated in the planning of this project since its initiation. Information provided in this report on fish and wildlife was furnished by our staff. Therefore our comments are limited. However, we would suggest that the following point be acknowledged in the final draft.

Adverse and positive effects would be sustained on wildlife resources if the proposed project is implemented as acknowledged (pages II-69 through II-72). At the same time, we stress that realization of the wildlife benefits outlined depends (in part) on landowner compliance with objectives of the plan. Compliance is not compulsory. The benefits outlined are reasonable and obtainable if the landowners so wish.

Thank you for the opportunity to review this draft. We hope our comments will be helpful.

Sincerely,

THE DEPARTMENT OF GAME

Eugene S. Dziedzic, Asst. Chief
Environmental Management Division

ESD:jt

cc: Kirkendall
Agencies

NIEL J. EVANS
GOVERNOR



RICHARD W. HEMSTAD
DIRECTOR

STATE OF WASHINGTON
Office of the Governor
OFFICE OF COMMUNITY DEVELOPMENT
OLYMPIA, WASHINGTON 98504
206/753-2200

December 22, 1975

File No. 1188

Mr. Galen S. Bridge
State Conservationist
U. S. Department of Agriculture
Soil Conservation Service
Room 360, U. S. Courthouse
Spokane, Washington 99201.

Dear Mr. Bridge:

This will acknowledge receipt of the Draft Environmental Impact Statement and Draft Plan for the Goose Creek Watershed project.

If you have not received a response from this office by the end of the review period, you can assume that we have no comments on the project.

Sincerely,

Lois E. Dufresne
A-95-EIS Coordination Section
Community Planning Division
LED:1

THORNBURG

BRIDGE



WASHINGTON STATE
PARKS & RECREATION COMMISSION

LOCATION: THURSTON AIRDUSTRIAL CENTER

PHONE 753-5755

P. O. BOX 1128

OLYMPIA, WASHINGTON 98504

January 7, 1976

IN REPLY REFER TO:

35-2650-1820

(E-467) Dr. EIS -
Goose Creek Watershed
Lincoln County, Wash.
USDA-SCS-EIS-WS-(ADM)-
75-1-D-WA

United States Department of Agriculture
Soil Conservation Service
Room 360, U. S. Courthouse
Spokane, Washington 99201

Attention Galen S. Bridge, State Conservationist

Gentlemen:

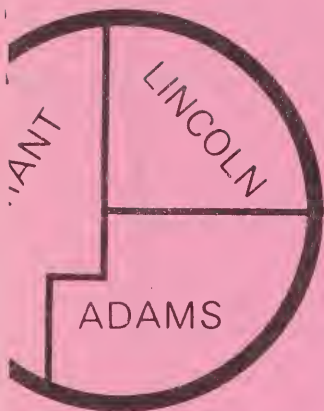
The Washington State Parks and Recreation Commission has reviewed the above noted document and can find no adverse impact on existing or proposed recreational areas or other areas of responsibility under the jurisdiction of the Commission.

Thank you for the opportunity to review and comment on this statement.

Sincerely,

David W. Heiser, Chief
Environmental Coordination

Arthur M. Skolnik
State Conservator



GRANT — LINCOLN — ADAMS COUNTY CONFERENCE OF GOVERNMENTS

c/o Grant County Planning Department
Courthouse, Ephrata, Washington 98823

January 30, 1976

Mr. Richard Poston
U. S. Department of Agriculture
Soil Conservation Service
Room 360
U. S. Courthouse
Spokane, Washington 99201

"A-95" Review
RE: 76-2 Draft Plan and Draft
Environmental Impact Statement
Goose Creek Watershed

Dear Mr. Poston:

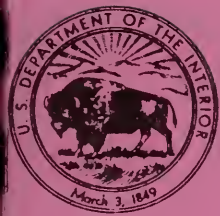
The Grant-Lincoln-Adams County Conference of Governments, as the District Clearinghouse for local governmental entities has reviewed the Draft Plan and Draft Environmental Impact Statement for the above project. A number of potentially interested agencies were notified of this particular project and copies of reactions received by the Clearinghouse are enclosed with this letter.

In looking over the comments you will note the Board of County Commissioners from Lincoln County is not prepared to take a stand either for or against the project at this time. The Lincoln County Health Department indicates they cannot issue complete approval because the Creston swamp abatement is not clear in that the water draining into the swamp will be diverted, but there is no actual plan given to drain the swamp in the draft plan. The Bureau of Reclamation indicates their comments will be forthcoming, and we will forward them on to you as soon as they are received.

Perhaps it would be in order to contact both the Lincoln County Health Department and the Board of County Commissioners and go through some of the items of concern with them. Any further comments to this office will be forthcoming.

Sincerely yours,

Julian S. Agranoff, Administrator
Grant-Lincoln-Adams County
Conference of Governments



United States Department of the Interior

BUREAU OF RECLAMATION

COLUMBIA BASIN PROJECT

BOX 815

EPHRATA, WASHINGTON 98823

IN REPLY
REFER TO: 421

120.1

JAN 21 1976

Grant-Lincoln-Adams County
Conference of Governments
Grant County Courthouse
Ephrata, WA 98823

Gentlemen:

Subject: Draft Plan and Draft Environmental Impact Statement -
Goose Creek Watershed, Lincoln County, Washington -
Your Project #76-2

Reference is made to your request of January 6, 1976, received here on January 16, for review and comments on the above project sponsored by the Soil Conservation Service, U.S. Department of Agriculture.

The Bureau of Reclamation commented on the preliminary investigation report of the Goose Creek Watershed proposal in a letter dated July 2, 1974, from the Regional Director at Boise. The letter was addressed to Gilbert J. Sheffels, member of the Steering Committee, with a copy to your office.

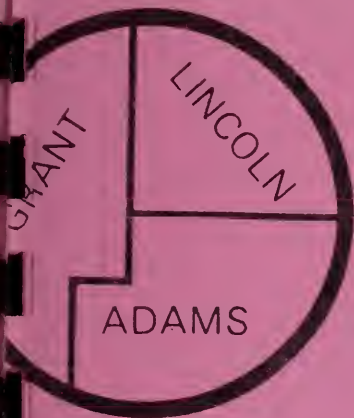
Under Department of the Interior policy, the office of the Secretary of the Interior coordinates the Department's comments on draft environmental impact statements prepared by other Federal agencies. It is noted that you have furnished a copy of the draft statement to the Department. Accordingly, you may expect to receive the comments of the Department in due course.

Sincerely yours,

John S. Unbewust
Project Manager



Save Energy and You Serve America!



GRANT — LINCOLN — ADAMS COUNTY CONFERENCE OF GOVERNMENTS

c/o Grant County Planning Department
Courthouse, Ephrata, Washington 98823

Date: January 16, 1976

TO: Julian S. Agranoff, Administrator
Grant-Lincoln-Adams County Conference of Governments

FROM: NAME: W. A. Van Leuven, R. S.

TITLE: Director of Environmental Health

AGENCY: Lincoln County Health Department

SUBJECT: REVIEW OF SUMMARY NOTIFICATION

APPLICANT U. S. Dept. of Agriculture, Soil Conservation Service

PROJECT Goose Creek Watershed

Draft Plan & Environmental Impact Statement

DIST. CLEARINGHOUSE # 76-2

☐ We do have an interest in the above project but have no comment.

☒ We do not have an interest in the above project

☐ We have a question or interest in the above project and wish to confer with the applicant.

☐ We wish to make the following comments: (Attach additional sheets if necessary)

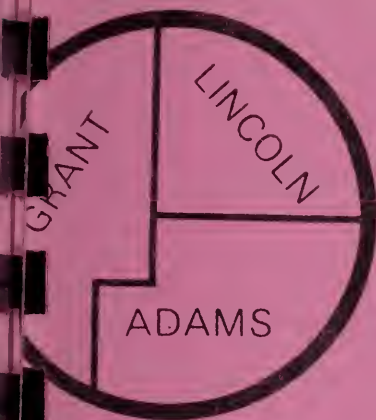
COMMENTS: (See Additional Sheet)

We cannot issue complete approval of the Goose Creek Watershed draft plan at this time. The Creston swamp abatement is not clear in that the water draining into the swamp will be diverted, but there is no actual plan to drain the swamp.

The swamp exists as a nuisance and health hazard to the people of Creston. Such swamp waters provide ideal breeding grounds for mosquitoes. During the summer of 1969, ten diagnosed cases of encephalitis were recorded for the scabland belt across northern Lincoln County. As long as such mosquito breeding areas exist adjacent to a concentration of people, there is a real danger of infecting humans with mosquito borne diseases.

The rest of the project is very much in order in that other wetlands will be drained and that the other health hazards existing or brought about by flood waters will be abated. A major example of this exists in the Town of Creston, in that flood waters have been leaching sewage into drainage ditches and thus eventually to Goose Creek.

cc: Town of Creston
Board of County Commissioners



GRANT — LINCOLN — ADAMS COUNTY CONFERENCE OF GOVERNMENTS

c/o Grant County Planning Department
Courthouse, Ephrata, Washington 98823

Date: January 20, 1976

TO: Julian S. Agranoff, Administrator
Grant-Lincoln-Adams County Conference of Governments

FROM: NAME: Terry Goodman

TITLE: Planning Director

AGENCY: Lincoln County Planning Dept.

SUBJECT: REVIEW OF SUMMARY NOTIFICATION

APPLICANT U. S. Dept. of Agriculture, Soil Conservation Service

PROJECT Goose Creek Water Shed

DIST. CLEARINGHOUSE # 76-2

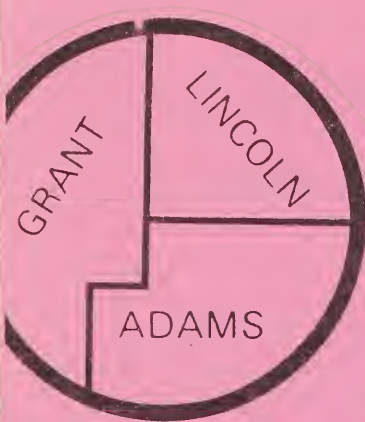
☒ We do have an interest in the above project but have no comment.

☐ We do not have an interest in the above project

☐ We have a question or interest in the above project and wish to confer with the applicant.

☐ We wish to make the following comments: (Attach additional sheets if necessary)

COMMENTS: _____



GRANT - LINCOLN - ADAMS COUNTY CONFERENCE OF GOVERNMENTS

c/o Grant County Planning Department
Courthouse, Ephrata, Washington 98823

Date: January 19, 1976

TO: Julian S. Agranoff, Administrator
Grant-Lincoln-Adams County Conference of Governments

FROM: NAME: Loren C. Moos
TITLE: Chairman
AGENCY: Lincoln County Commissioners

SUBJECT: REVIEW OF SUMMARY NOTIFICATION

APPLICANT U. S. Department of Agriculture

PROJECT Goose Creek Water Shed

DIST. CLEARINGHOUSE # 76-2

- ☒ We do have an interest in the above project ~~but have no comment.~~
- ☐ We do not have an interest in the above project
- ☐ We have a question or interest in the above project and wish to confer with the applicant.
- ☐ We wish to make the following comments: (Attach additional sheets if necessary)

COMMENTS: We are not prepared to take a stand either for or

against this project at this time.

FRIENDS OF THE EARTH, INC.

23 February 1976

Mr. Gene R. Thornburg
Soil Conservation Service
Watershed Planning
Room 360, U.S. Courthouse
Spokane, WA 99201

Dear Mr. Thornburg:

We have received a copy of the draft Environmental Impact Statement for the Goose Creek Watershed Project, Lincoln County, WA and thank you for extending the comment period. The following are the comments of the Northwest Office, Friends of the Earth:

GENERAL COMMENTS

Friends of the Earth fully supports the Soil Conservation Service in its attempt to provide a level of land treatment that will allow maximum production on our agricultural lands while conserving and enhancing the natural resource base. While recognizing the damage that floods can inflict upon businesses and residences in a flood plain, we feel that structural measures cause even more development in normally unsuitable areas. Flood prone areas should be respected for what they are: Areas prone to Flooding!! For this reason we strongly recommend implementation of Alternative B which is the only alternative that would guide land developments in flood-prone areas in order to avoid or reduce future flood damage. In an era of Energy Conservation we should be looking at nonstructural methods to achieve flood control goals.

More specific DEIS comments are as follows:

II Summary p. II-2

Change section E to read: "Land use will be altered. . .with creation of a 235-acre reservoir; . .

Structural Measures p. II-10

What percentage of the total capacity will be in sediment storage?

Recreation Problems p. II-55

It states, "Some of the present recreational facilities are over utilized [at Lake Roosevelt] during peak summer months". This is not borne out by the succeeding statements that Lake Roosevelt has not proven to be a good fishery, it discourages many would-be

bathers and debris presents a hazard for boaters. It would appear from this that recreational opportunities have not panned out at Lake Roosevelt. Can we be sure that the recreational benefits of the Goose Creek Reservoir, (which the Cost-Benefit Analysis in Appendix A shows as the sole reason it exceeds 1:1) have not been optimistically overestimated? Why would the Reservoir make a good fishery where Lake Roosevelt does not?

A. Conservation Land Treatment p. II-60

It states, "The combined effects of land treatment measures on cropland will reduce the annual soil loss from approximately 7 tons per acre to within allowable limits."

A monitoring system to evaluate impacts on all resources within the watershed must be an essential part of any project planning and implementation effort. It is the detection system through which project effects can be measured and evaluated by management.

Outside of stream gages (p. II-11) and inspection after severe floods, (p. II-20), no monitoring program is outlined that would determine if annual soil loss is within allowable limits. The lack of a coordinated monitoring program to see that objectives for any activity are met with definite assignments encompassing research, watershed, aquatic and other functional areas is a serious shortcoming of this plan.

Furthermore, Executive Order 11514 Protection and Enhancement of Environmental Quality Sec 2 (a) directs the heads of Federal agencies to "Monitor, evaluate, and control on a continuing basis their agencies' activities so as to protect and enhance the quality of the environment." (Emphasis ours) Nowhere in this plan, contrary to Executive Order 11514, is any mention made of a mechanism for monitoring, evaluation or control.

D. Favorable Environmental Impacts p. II-69

3. "Sediment deposition will be reduced on 50 acres of cropland and 8 acres of pasture land." Is this a favorable impact? Doesn't deposition of suspended sediment loads add to the fertility of the soil?

5. "Area downstream of the watershed will experience less sediment deposition and floodings." Again, we object to the blanket implication that less sediment deposition is a favorable impact. Can you support that statement?

8. Change to read, "The reservoir will provide resing area for approximately 2,100 ducks and geese annually, with 600 hunting days."

15.-16. According to these figures, 393 acres will be lost for productive use in order to protect 236 acres of land in Wilbur and Creston. In view of our shrinking agricultural base, this trade off does not appear justifiable.

VII. Short-Term vs. Long-Term Use of Resources p. II-82

In view of the increasing need for Energy Conservation, we ask that Energy be included as a factor in this section. (By this we mean the Energy foregone in construction and implementation of this plan.)

SUMMARY

In conclusion, the EIS does not make clear the tradeoffs involved: the land, its productivity, and especially its contribution to Environmental Quality that will be foregone in protecting structures built on what is clearly a flood-prone area.

The mandate in Sec. 1001 of PL-83-566 to preserve and protect the Nation's land and water resources has been circumvented by the lose of nearly 400 acres. We strongly urge that Alternative B be implemented since it comes closest to achieving the project goals while remaining within SCS's Policy.

We hope these comments have been of some help in revising your draft and we will be looking forward to seeing what changes you have made in your final plan and statement.

Thank you for allowing us to comment on the draft EIS for the Goose Creek Watershed Project, Lincoln County, WA.

Sincerely,



David E. Ortman
Research Associate
Friends of the Earth

DEO/tim

20 FEB 1976

Honorable Robert W. Long
Assistant Secretary of Agriculture
Washington, D. C. 20250

Dear Mr. Long:

In compliance with the provisions of Section 5 of Public Law 566, 83rd Congress, the Washington State Conservationist of the Soil Conservation Service, by letter dated 12 December 1975, requested the views of the Secretary of the Army on the draft plan and draft environmental impact statement for the Goose Creek Watershed, Washington.

We have reviewed the drafts and find them generally satisfactory and foresee no conflicts with any projects or proposals of this Department. We do, however, have the following comments to offer.

We feel that the nonstructural alternatives for reducing urban flood damages should have been more thoroughly discussed. Alternative B cites flood insurance and land use regulations as alternatives but does not evaluate them. Land use regulations should be evaluated, particularly in conjunction with relocations and flood proofing.

The Washington State Conservationist should be informed that regulatory permits will be required for work that affects navigable waters and requests for such permits should be made to the Seattle District Office of the Corps of Engineers at the earliest possible date.

Thank you for the opportunity to review the draft plan and draft statement.

Sincerely,

Signed

Charles R. Ford
Deputy Assistant Secretary of the Army
(Civil Works)

bc:
G. S. Bridge, SCS, Spokane, Washington

APPENDIX D

Conservation land treatment measures applicable to Goose Creek Watershed, Lincoln County, Washington.

Conservation Cropping System

(Two-year - Wheat - Summer - Fallow)

This cropping system refers to a sequence of winter wheat and fallow. Usual winter wheat planting is in the first week of September, with harvesting approximately the first of August. After harvest, and approximately in late September, chisel tillage is undertaken with the objective of leaving a large cloddy soil surface with the stubble standing. The condition is prime for absorbing and retaining winter moisture. In April of the second year, the spring cultivation begins. Weeds are controlled, fertilizer is applied, and then winter wheat is seeded in September.

(Three-year - Wheat - Barley - Summer - Fallow)

This cropping system refers to a cycle similar to that of the two-year cycle. In the spring of the second year, spring barley or spring wheat is planted. This occurs approximately the second week of April and it is harvested about the second week of August. After harvest of the second crop, the fall chiseling, followed by summer fallow and September seeding, completes the cycle.

Supporting Practices

(Proper Grazing Use)

Grazing at an intensity which will maintain enough cover to protect the soil and maintain or improve the quantity and quality of desirable vegetation. The purpose is to (1) increase the vigor and reproduction of

key plants; (2) accumulate litter and mulch necessary to conserve soil and water; (3) improve or maintain condition of the vegetation; (4) increase forage production; and (5) maintain natural beauty.

(Deferred Grazing)

Postponing grazing or resting grazing land for a prescribed period. The purpose is to (1) promote natural revegetation by increasing the vigor of the forage stand and permitting desirable plants to produce seed; (2) provide a feed reserve for fall and winter grazing or emergency use; (3) to improve the appearance of range with inadequate cover; and (4) to improve hydrologic conditions and reduce soil loss.

(Crop Residue Use)

This refers to the utilization of crop residue in the "re-crop" or annual cropping situation, typical of the three-year rotation. Wheat residues are left on the surface for winter protection until spring grain is seeded.

(Stubble Mulching)

This refers to protective residues which are utilized over a longer period than crop residue use. This practice applies to the wheat-fallow rotation. Wheat residues are left on the surface over winter and are also left on the surface the following summer. These residues last into the next winter while the new wheat crop is developing a protective canopy.

(Chiseling)

Fall tillage usually performed to control cheatgrass and volunteer wheat with a minimum reduction of crop residue. This is an essential part of stubble mulching if fall tillage is necessary. There may be additional benefits, such as better moisture penetration. The depth varies from 8

to 16 inches and may prevent the build-up of shallow tillage and traffic pans.

(Grassed Waterway)

This measure refers to a shaped waterway seeded to permanent cover and installed in a natural drainage way. After design and layout, the waterway is seeded to a suitable grass or legume for erosion control.

(Stripcropping)

Crops grown in a series of strips across the general slope (field strips), or on the contour (contour strips). The crops are arranged so that fallow and wheat alternate. Strips could also include grass. The strips form a permanent guideline for cross-slope or contour farming.

(Level Terrace)

A channel constructed across the gentle slopes at a suitable spacing but without a grade. Usually follows the contour; therefore spacing is not uniform. Usually holds water for gradual infiltration; therefore is generally larger in cross-section than a gradient terrace.

(Gradient Terrace)

A channel constructed across the slope at a suitable spacing and with an acceptable grade. This type of terrace usually empties into a grass waterway or some other protected outlet. Gradient terraces can be installed on steeper slopes than level terraces.

(Divided Slope)

This "two-strip" treatment is applied to a slope when the land operator is not willing to apply a series of field strips or contour strips. The advantage of this measure is to have half the slope protected by stubble or crop, while half is exposed in any one year.

(Debris Basin)

A barrier or dam constructed across a waterway or at other suitable locations to form a silt trap or sediment basin.

(Streambank Protection)

This measure involves stabilizing and protecting banks of streams, lakes, estuaries, or excavated channels against scour and erosion from high water by using vegetative or structural means.

(Grade Stabilization Structure)

A structure to stabilize the grade or to control head cutting in natural or artificial channels.

APPENDIX E

Selected Definitions
of Wetland Types from
"WETLANDS OF THE UNITED STATES"

by

Samuel P. Shaw and C. Gordon Fredine

issued 1956

Circular 39

Fish and Wildlife Service

U.S. Department of the Interior

Type 1 wetlands are seasonally flooded basins or flats. The soil is covered with water, or is waterlogged, during variable seasonal periods but usually is well drained during much of the growing season.

Type 2 wetlands are inland fresh meadows, usually without standing water during most of the growing season, but are waterlogged within at least a few inches of the surface. Vegetation includes grasses, sedges, rushes, and various broad-leaved plants.

Type 3 wetlands are inland shallow fresh marshes. The soil is usually waterlogged during the growing season; often covered with as much as 6 inches or more of water. Vegetation includes grasses, bulrushes, spikerushes, and various other marsh plants, such as cattails, arrowheads, pickerelweed, and smartweeds.

Type 4 wetlands are inland deep fresh marshes. The soil is covered with 6 inches to 3 feet or more of water during the growing season. Vegetation includes cattails, reeds, bulrushes, spikerushes, and wild rice. Open water areas may contain pondweeds, coontail, waterweeds, duckweeds, waterlilies, naiads, watermilfoils, or spatterdocks.

Type 5 wetlands are inland open fresh water areas. Shallow ponds and reservoirs are included in this type. Water is usually less than 10 feet deep and is fringed by a border of emergent vegetation. Vegetation (mainly at water depths of less than 6 feet) includes pondweeds, naiads, wild celery, coontail, watermilfoils, muskgrasses, waterlilies, and spatterdocks.

Type 9 wetlands are inland saline flats. The soil is without standing water except after periods of heavy precipitation, but it is waterlogged to within a few inches of the surface during the growing season. Vegetation (often sparse or patchy) consists of salt tolerant plants, such as

seablite, saltgrass, Nevada bulrush, saltbush, and burro-weed.

Type 10 wetlands are inland saline marshes. The soil is usually waterlogged during the growing season and is often covered with as much as 2 to 3 feet of water. This type occurs mostly in shallow lake basins. Vegetation is mainly alkalai or hardstem bulrushes, often with wigeon-grass or sago pondweed in openings.

Type 11 wetlands are inland open saline water. These more permanent areas of shallow, saline, water are often closely associated with Types 9 and 10. Depth of water is variable. Vegetation (mainly at water depths of less than 6 feet) includes sago pondweed, wigeongrass, and muskgrasses.

APPENDIX F

COMMUNICATIONS REGARDING THE POSSIBILITIES
OF HISTORICAL OR ARCHAEOLOGICAL SITES
IN GOOSE CREEK WATERSHED,
LINCOLN COUNTY, WASHINGTON



WASHINGTON ARCHAEOLOGICAL RESEARCH CENTER
WASHINGTON STATE UNIVERSITY, PULLMAN, WASHINGTON 99163

DIRECTOR
RICHARD D. DAUGHERTY, PH.D.

ASSISTANT DIRECTOR
HARVEY S. RICE

PHONE 509-335-6681
SCAN 426-6681

October 13, 1975

Mr. Gene Thornburg, Staff Leader
Water Shed Planning
Soil Conservation Service
360 U.S. Courthouse
Spokane, WA 99201

Dear Mr. Thornburg:

On October 2, 1975, Mr. Jerry Weller and I visited the archaeological site discussed by Dr. James Alexander in his report on the archaeological resources in the Goose Creek Watershed. In my opinion, this archaeological site holds great promise for revealing data about the prehistory of the Columbia Plateau. Indications are that it has been utilized by aboriginal populations and its location suggests that it may contain a long sequence of occupation.

This being the case, the site is eligible for nomination to the National Register of Historic Places. Since the site is on private land and not within your project boundaries, I have suggested to the Office of Archaeology and Historic Preservation in Washington State Parks and Recreation, that they undertake the National Register nomination with our assistance. They have agreed to do so (the Office of Archaeology and Historic Preservation is under the direction of the State Historic Preservation Officer).

A problem of the preservation of this site may exist in relation to your planned Goose Creek project. The rockshelter has not been damaged by relic collectors in the past. Apparently this is only because it is in a remote area and the mouth of the shelter is obscured by a screen of vegetation. Most of the rockshelters in the Plateau which contain cultural material have been dug by relic collectors and the stratigraphy and contents of the cultural deposits have been badly damaged or destroyed. It would seem that the proximity of your proposed project to this archaeological site, a distance of only a few hundred feet from the planned damsite, may cause substantial impacts to the site. These impacts would consist of first, the presence of construction personnel and, ultimately, an influx of people into the planned recreation area. This site is bound to be damaged or destroyed when discovered. Your recreation plan will, of course, encourage people to come into the area and thus provide an impact to the site.

I can see only two viable possibilities for mitigating impacts to the site under the above mentioned circumstances.

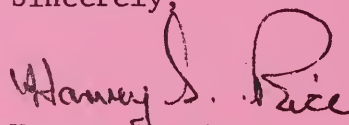
Page 2
Gene Thornburg
October 13, 1975

1. Excavate the site by the use of the best archaeological techniques to permanently record the data contained within the site. An excavation costing approximately \$12,000 would establish if the site is as important as it appears to be in the culture history of the Plateau, and, if so, if further work would be needed at the site.
2. Protect the site by fencing and patrolling. This would be difficult to do and would require a continuing program for all time.

Of the above two suggestions, the first would seem the most prudent and least expensive in the long run.

I hope that the presence of this archaeological site does not seriously hamper your planning, but I do feel that we may be dealing with a very important non-renewable cultural resource at this site.

Sincerely,


Harvey S. Rice
Assistant Director

HSR:glr

cc: Office of Arch. & Historic Preservation



HAWORTH & ANDERSON

WEST 621 MALLON AVENUE

SPOKANE, WASHINGTON 99201

(509) 327-9579

June 28, 1974

Charles F. Bohannon
Archaeologist
Pacific Northwest Regional Office
National Park Service
525 Fourth & Pike Building
Seattle, WA 98101

Dear Mr. Bohannon:

Our firm has been contracted by the Soil Conservation Service to prepare an environmental impact statement for a project involving the Goose Creek Watershed, upstream from Wilbur, Washington. Wilbur, Washington lies in the central northern portion of Lincoln County, Washington. The watershed is indicated on the attached map.

I would appreciate your assistance by advising us of any areas or sites of archaeological value within this watershed. I realize that unless a complete examination of the watershed has occurred, you cannot categorically answer my inquiry. However, if any sites are known to exist I would appreciate being so advised. It would be safe for me to say that in the event a place of archaeological value should be found, you or a member of your staff would be notified immediately by the Soil Conservation Service.

I greatly appreciate any effort you may be able to put into my inquiry and I look forward to your response in the near future. Thank you very much.

Sincerely yours,

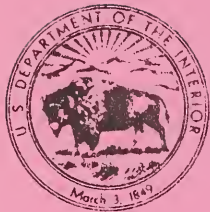
HAWORTH AND ANDERSON, INC.

Thomas G. Mosher, A.I.P.
Vice President

TGM:kjh

cc: Stan Hobson, Soil Conservation Service

Attachment



United States Department of the Interior

NATIONAL PARK SERVICE

Pacific Northwest Region
Fourth and Pike Building
Seattle, Washington 98101

IN REPLY REFER TO:

H2219
(PNR)PSA

July 2, 1974

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JUL 5 1974

H & A

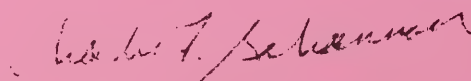
Mr. Thomas G. Mosher, A.I.P.
Vice President
Haworth and Anderson
West 621 Mallon Avenue
Spokane, Washington 99201

Dear Mr. Mosher:

This is in response to your letter of June 28 concerning archeological resources in the Goose Creek Watershed Project of the Soil Conservation Service. The project was inspected for sites in August, 1972, under the direction of Dr. Frank Leonhardy of Washington State University. No archeological remains were located.

The National Park Service is also charged with reviewing statements to insure that historical resources are adequately dealt with. We therefore suggest that you consult The National Register of Historic Places (Federal Register of February 19, 1974) and the State Historic Preservation Officer to determine if National Register properties are effected by the project. The results of these consultations should be recorded in the environmental impact statement, and if National Register properties are involved, the statement should state the impacts upon them and any measures proposed to mitigate the impact. The Washington State Historic Preservation Officer is Mr. Charles H. Odegaard, Director, Washington State Parks and Recreation Commission, Box 1128, Olympia, Washington 98504.

Sincerely yours,


Charles F. Bohannon
Regional Archeologist



HAWORTH & ANDERSON

WEST 621 MALLON AVENUE

SPOKANE, WASHINGTON 99201

(509) 327-9579

July 5, 1974

Mr. Charles H. Odegaard, Director
Washington State Parks and Recreation Commission
Box 1128
Olympia, Washington 98504

Dear Mr. Odegaard:

Our firm has been contracted by the Soil Conservation Service to prepare an environmental impact statement for a project involving the Goose Creek Watershed, upstream from Wilbur, Washington. Wilbur, Washington lies in the central northern portion of Lincoln County, Washington. The watershed is indicated on the attached map.

I would appreciate your assistance by advising us of any areas or sites of historical value within this watershed. I have contacted Mr. Albert Culverwell, Eastern Washington State Historical Society and Mr. Virgil Rux, Lincoln County Historical Society, with a similar inquiry. I have also examined The National Register of Historic Places (Federal Register of February 19, 1974) and find no pertinent listings. However, I am aware that you may be able to advise me of any applications which may be in process, and I would appreciate being so advised.

I greatly appreciate any effort you may be able to put into my inquiry and I look forward to your response in the near future. Thank you very much.

Sincerely yours,

HAWORTH AND ANDERSON, INC..

Thomas G. Mosher, A.I.P.
Vice President

TGM:slc

cc: Stan Hobson, Soil Conservation Service

Attachment



WASHINGTON STATE

ADVISORY COUNCIL ON HISTORIC PRESERVATION

P. O. BOX 1128, OLYMPIA, WASHINGTON 98504

DANIEL J. EVANS, Governor

RALPH D. ANDERSON

KEITH A. ANGIER

MRS. GEORGE CORLEY, JR.

ALBERT CULVERWELL

JON DANIELSON

KENNETH R. HOPKINS

BRUCE LE ROY

HARVEY S. RICE

DR. DAVID H. STRATTON

MRS. ERIC FEASEY, Chairman

CHARLES H. ODEGAARD, Executive Director

July 30, 1974

Mr. Thomas G. Mosher
Vice President
Haworth and Anderson
West 621 Mallon Avenue
Spokane, Washington 99201

Dear Mr. Mosher:

Your letter to Charles H. Odegaard, Director of the Washington State Parks and Recreation Commission, concerning an environmental impact statement for a project involving the Goose Creek Watershed, Lincoln County, has been referred to me for reply.

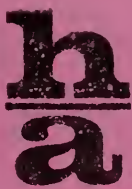
There are at this time no properties in the state inventory of historic places for the area of your concern. I would suggest that you contact the Washington Archaeological Research Center Washington State University, Pullman, 99163, for additional information.

Thank you for the opportunity to comment on your project.

Sincerely,

David M. Hansen, Chief
Office of Archaeology
and Historic Preservation

gj



HAWORTH & ANDERSON

WEST 621 MALLON AVENUE

SPOKANE, WASHINGTON 99201

(509) 327-9579

June 26, 1974

Mr. Albert Culverwell,
Director
Eastern Washington State
Historical Society
W. 2316 First
Spokane, WA 99204

Dear Mr. Culverwell:

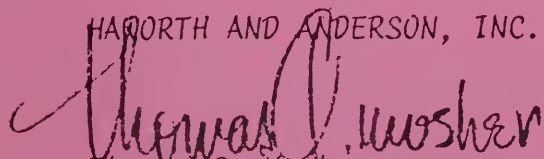
As per our telephone conversation on June 25, 1974, I am officially requesting information concerning the existing and/or recognized historical sites or buildings that may be existent in the Goose Creek Watershed in Lincoln County, Washington. Such information is required for the draft environmental impact statement for improvements in the watershed. The impact statement is being done for the Soil Conservation Service. The watershed lies roughly between the cities of Creston and Wilbur, Washington and directly north almost to Lake Roosevelt. I have enclosed a map identifying this watershed area.

As usual with these matters, time is of the essence and I would appreciate a response as soon as possible.

Thank you very much for your assistance in this matter.

Sincerely,

HAWORTH AND ANDERSON, INC.


Thomas G. Mosher,
Vice President, A.I.P.

TGM:kjh

Enclosure



EASTERN WASHINGTON STATE
HISTORICAL SOCIETY



CHENEY COWLES MEMORIAL MUSEUM
GRACE CAMPBELL MEMORIAL HOUSE

ALBERT H. CULVERWELL
Director

WEST 2316 FIRST AVENUE • SPOKANE WASHINGTON 99204 • PHONE (509) 456-3931

July 2, 1974

Mr. Thomas J. Mosher
Haworth & Anderson
West 621 Mallon Avenue
Spokane, Washington 99201

Dear Mr. Mosher:

In answer to your letter of June 26, relative to historic sites or buildings existent in the Goose Creek Watershed in Lincoln County, I have this to report. To my knowledge, there is no historical site or building of any great importance in the area which you have described. It is a rather vast area and I believe it might be wise to contact the Lincoln County Historical Society in Davenport for their opinion. I believe Mr. Virgil Rux is the President of the Society and possibly he might be reached by addressing a letter to him at Davenport, Washington.

Since the watershed extends north almost to Lake Roosevelt, the National Park Service might be interested. I am thinking of the National Recreation Area which they have established and I believe their offices are in Coulee Dam. The superintendent is William Burgen.

I trust the above will be of some assistance to you in this matter.

Sincerely,

Albert H. Culverwell
Director

AHC:pak

RECEIVED

JUL 3 1974

H & A



HAWORTH & ANDERSON

WEST 621 MALLON AVENUE

SPOKANE, WASHINGTON 99201

(509) 327-9579

June 26, 1974

Professor Richard Daugherty
Department of Anthropology
Washington State University
Pullman, WA

Dear Mr. Daugherty:

I obtained your name through an initial contact with Mr. Albert Culverwell of the Eastern Washington State Historical Society. Haworth and Anderson, Inc. is under contract to the Soil Conservation Service to prepare a draft environmental impact statement for the Goose Creek Watershed area in the northern part of Lincoln County, Washington. One of our standard areas of investigation is to determine the existing and known historical and archaeological sites in the study area. Mr. Culverwell is assisting us in the area of historical sites and suggested that you may be a potential resource for any known archaeological sites within the study area. I have enclosed a map of that study area in hopes that this will assist you in any potential reply to my inquiry.

I realize that you can not categorically state that there are no significant or even insignificant archaeological sites in the study area until you have, of course, examined the entire area. However, I do hope that you can make me aware of any identified and known "finds" or diggings in the area indicated on the map. Our impact statement would, of course, carry any qualifications that you would wish to make, such as, that the area has not been explored enough to categorically state that there are no archaeological sites.

As usual with a request of this sort, time is of the essence and we would appreciate as prompt a reply as possible. At any rate, please accept my gratitude for any time which you spend with this request.

Sincerely,

HAWORTH AND ANDERSON, INC.

Thomas G. Mosher, A.I.P.
Vice President

TGM:kjh

Enclosure

ARCHAEOLOGY RESEARCH ASSOCIATES

P. O. Box 195

Pullman, Washington 99163

509-567-6181

509-397-4168

July 9, 1974

Mr. Thomas G. Mosher, A.I.P.
Vice President
Haworth and Anderson
West 621 Mallon Avenue
Spokane, Washington 99201

Dear Mr. Mosher:

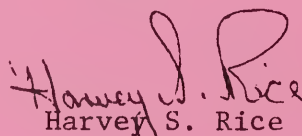
I am an associate of Dr. Daugherty and, since he is engaged in archaeological field work on the coast this summer, he has requested that I reply to your inquiry.

A review of the records indicates that there are no archaeological sites known to us within your study area. As you have observed in your letter, this is due to the fact that no survey for archaeological sites has been made in the area. There is every reason to expect that a survey would disclose archaeological resources, particularly along existing or ancient watercourses and adjacent to springs, waterholes, and ponds. Caves are known to occur in this area and they would also very likely bear the evidences of past inhabitants.

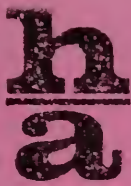
If you need an inventory of archaeological resources in the area derived from an on-foot examination, we would be pleased to provide this service. I would certainly recommend this course of action if impacts to archaeological resources are a possibility. I might point out that even providing public access to an area can impact archaeological resources through increased relic collecting activity.

It is evident from your letter that you have a real grasp on the problem of determining whether or not archaeological sites occur within an area. Thank you for your concern over archaeological resources. I hope that we can be of service to you.

Sincerely,


Harvey S. Rice
Archaeologist

HSR:mch



HAWORTH & ANDERSON

WEST 621 MALLON AVENUE

SPOKANE, WASHINGTON 99201

(509) 327 9579

June 26, 1974

Lincoln County Historical
Society
Mr. Virgil Rux
Davenport, WA

Dear Mr. Rux:

Our firm is engaged in an environmental impact statement preparation for the Goose Creek Watershed in Lincoln County. One of our standard investigations is to determine the presence of any existing and known historical sites or buildings in the study area. I have contacted Eastern Washington Historical Society and their director, Mr. Albert Culverwell, referred me to you concerning any matters of local importance that he may be unaware of.

As usual with these matters time is of the essence and we would appreciate your prompt attention to this matter. For your convenience I have included a map indicating the boundaries of the watershed study area.

Thank you very much for any consideration which you give to this matter.

Sincerely,

HAWORTH AND ANDERSON, INC.

Thomas G. Mosher, A.I.P.
Vice President

TGM:kjh

Enclosure

APPENDIX G

WATER QUALITY STANDARD
AND
WATER QUALITY TESTS

APPENDIX G

Water Quality Standard for Class B Good 1/

a. General Characteristic

Water quality of this class exceeds or meets the requirements for most uses.

b. Characteristic Uses

Characteristic uses include, but are not limited to, the following:

General recreation and aesthetic enjoyment (fishing, swimming, skiing, and boating).

Fishery and wildlife habitat.

Industrial and agricultural water supply.

Stock watering.

Commerce and navigation.

Shellfish reproduction and rearing, and crustacea (crabs, shrimp, etc.) harvest.

c. Water Quality Standards

Total Coliform Organisms shall not exceed median values of 1,000 with less than 20% of samples exceeding 2,400 when associated with any fecal source.

Dissolved Oxygen shall exceed 6.5 mg/- (FRESH WATER) or 5.0 mg/l (MARINE WATER), or 70% saturation whichever is greater.

Temperature No measurable increases shall be permitted within the waters designated which result in water temperatures exceeding 70° F (21.1° C) (FRESH WATER) or 66° F (18.9° C) (MARINE WATER) nor shall the cumulative total of all such increases arising from nonnatural causes be permitted in excess of $t = 110/(T-15)$ (FRESH WATER) or $t = 52/(T-32)$ (MARINE WATER); for purposes hereof "t" represents the permissive increase and "T" represents the resulting water temperature.

pH shall be within the range of 6.5 to 8.5 (FRESH WATER) or 7.8 to 8.5 (MARINE WATER) with an induced variation of less than 0.5 units.

Turbidity shall not exceed 10 JTU over natural conditions.

Toxic, Radioactive or Deleterious Material Concentrations shall be below those which adversely affect public health during the exercise of characteristic usages, or which may cause acute or chronic toxic conditions to the aquatic biota, or which may adversely affect characteristic water uses.

1/ From Water Quality Report - Crab Creek, December 1970 - March 1971

Aesthetic Values shall not be reduced by dissolved, suspended, floating or submerged matter, not attributable to natural causes, so as to affect water usage or taint the flesh of edible species.

WATER QUALITY STANDARDS

Exact and complete standard definitions are found in Appendix II. Apparent standard violations are determined according to the following definitions:

Dissolved Oxygen. An apparent violation is recorded whenever the D.O. (in mg/l or % saturation) drops below the level specified in the standard.

pH. An apparent violation is recorded whenever the pH exceeds the range specified in the standard.

Turbidity. An apparent violation is recorded whenever the turbidity at one station exceeds the turbidity of its immediate up-stream station by the amount specified in the standard.

Temperature. An apparent violation is recorded whenever the temperature exceeds the maximum limit specified in the standard (Ex: Class AA = 60° F).

Total Coliform. The coliform standard is applied to the total data collected during a quarter rather than individual values. An apparent violation is recorded when either the quarterly median value exceeds the limit specified in the standard, or a specific percentage of values exceeds the maximum limit specified in the standard.

METALS (Klein, McKee & Wolf)

It has been demonstrated that various metals, even at very low concentrations, can be toxic to fish and related organisms. However, it must be emphasized that the lethal concentration of a metal is not a fixed quantity, but depends on the species, size, age, state of health and degree of acclimation of the fish; the chemical composition of the water (especially pH, dissolved oxygen, hardness, dissolved mineral salts and the presence of other metals); and the temperature.

The following table lists the approximate lethal concentrations for several metals:

Metal		Approximate Lethal Concentration (ug/l)
Mercury	(Hg)	10
Copper	(Cu)	20
Zinc	(Zn)	300
Lead	(Pb)	300
Chromium	(Cr)	1,000
Lithium	(Li)	1,000,000
Strontium	(Sr)	1,000,000

NITROGENOUS AND PHOSPHORIC COMPOUNDS (Sawyer, Klein)

Municipal, domestic and other waste water discharges often contain sufficient quantities of nitrogenous and phosphoric compounds to cause increases in the receiving waterways. The following table lists critical parameter levels and the significance of these parameter levels.

Substance	Critical Level (mg/l)	Significance
Nitrate (NO_3 -N)	.3	Algae bloom potential
Nitrite (NO_2 -N)	.02	Organic pollution, low oxygen concentration in stream
Ammonia (NH_3 -N)	.2	Organic pollution
Ammonia (NH_3 -N)	1.0	Unattractive for fish (toxic)
Ortho Phosphate (O-PO_4 -P)	.01	Algae bloom potential

HARDNESS (Klein)

Hardness can affect a water's useability for domestic and industrial purposes. It can also affect other constituents in a waterway such as metals, making the aquatic environment less toxic. The following table lists various hardness ranges and their common descriptions.

Hardness as CaCO_3 (ppm)	Description of Water
0 - 50	Soft
50 - 100	Moderately soft
100 - 150	Slightly hard
150 - 200	Moderately hard
200 - 300	Hard
over 300	Very hard

ALKALINITY (Klein)

Alkalinity should be in excess of 25 ppm - preferably around 100 ppm. This provides sufficient buffering capacity to protect aquatic life against rapid and pronounced pH changes.

WATER QUALITY ANALYSIS - GOOSE CREEK WATERSHED

Site #2 Sherman Draw 6/

Date	12/18/73	7/29/74	8/11/74	1/20/75	3/20/75	3/31/75	4/8/75	4/24/75	5/12/75	5/23/75	6/6/75	6/17/75	7/1/75	7/29/75	9/9/75
Temp. °F.	36	70			36	40	40	41	58	58	54	58	60	62	58
Dissolved oxygen mg/l	14	11.25						8.15							
Lab pH	7.8	8.12	8.25	6.6											
Total coliforms per 100 ml	TNC 1/	2400		75		4	TNC 1/	192	0 2/	5/	5/	120	300	1200	46
Fecal coliforms per 100 ml		158		34											
Streamflow - cfs.	2				7	5	4	7	4	3	2.5	2.5	2.0	2	2
Turbidity - NTU 4/	45		1.7	10				3.9	1.6 3/	2.4	2.5	3.3	3.6	3.4	
Total phosphates mg/l	2.35														
Metaphosphates mg/l															
Ortho phosphates mg/l	-		.15					.30	.58	.12	.08	.16	.19	0.30	0.25
Alkalinity mg/l	125							190.93	190.32	174.46	170.19	183.6	183.6	186.66	186.66
Nitrate mg/l	1.7		1.37			.023		3.5	1.71	4.69	4.0	4.2	3.26	2.86	2.27
Nitrite mg/l	.009		.003					.008	.015	.011	.29	0.052	.035	0.037	0.029
Ammonia mg/l			.06					.17	.27	.02	.02	.16	.1	0.08	0.32
Calcium mg/l			40.88					42.40	36.0	38.4	40.88	43.2	44.8	40.0	44.0
Sodium and potas- sium mg/l			23.69					37.47	42.32	29.67	23.92	21.39	31.5	19.09	29.9
Conductivity @ 25° C			355					455	436	429	393	397	436	427	450
Sulfate mg/l			23.53												
Chloride mg/l			15.24												
Silica mg/l			32.2												
Dissolved solids				8	100			303	291	286	262	265	290	285	300
Total hardness mg/l	110														
Color	150														
Magnesium mg/l			5.84					10.25	9.23	13.61	10.78	11.18	9.72	17.98	12.64

- 1/ TNC too numerous to count in an undiluted sample. (300)
- 2/ No livestock along creek @ this time.
- 3/ Sample was Filtered.
- 4/ Nephelometer Turbidity Units
- 5/ Tests indicate positive for coliforms; actual counts not taken.
- 6/ Testing site 200' upstream from the confluence of Goose Creek.

WATER QUALITY ANALYSIS - GOOSE CREEK WATERSHED

Site # 3 Goose Creek 5/

Date	12/13/73	5/24/74	7/29/74	8/11/74	1/20/75	3/21/75	3/31/75	4/8/75	4/24/75	5/12/75	5/23/75	6/6/75	6/17/75	7/1/75	7/29/75	9/9/75
Temp. of.	40		54			39	40		40		54	50	52	54	54	54
Dissolved oxygen			12.7						8.01							
mg/l			7.55													
Lab PH	7.6			7.2	6.8											
Total coliforms																
per 100 ml																
Fecal coliforms																
per 100 ml																
Streamflow - cfs.	2		2,000			0			8	4	4	4	160	292	1200	192
Turbidity - NTU	2		2			5			.6	.73	2	3.0	7.3	21.0	2	2
Total phosphates				1.9	25										1.6	
mg/l																
Metaphosphates mg/l	2															
Ortho phosphates	1.65															
mg/l																
Alkalinity mg/l	.35			.3					.23	.33	.28	.25	.34	.34	0.33	0.36
Nitrate mg/l	100			1.54			.009		145.79	156.77	200.08	126.27	163.5	165.31	157.99	152.50
Nitrite mg/l	1.9		.0010	.003					.79	.45	1.0	.9	1.02	1.22	1.27	1.30
Ammonia mg/l	.003			.01					0	.001	.001	.001	.004	.005	0.006	0.003
Calcium mg/l				27.45					.05	.05	.06	.01	.13	.1	0.01	0.16
Sodium and potas-									30.08	29.6	32.0	30.40	30.4	31.2	30.4	28.8
sium mg/l																
Conductivity @ 25° C				15.87					20.46	26.35	19.55	17.25	16.79	21.1	21.62	23.5
Sulfate mg/l				270					313	306	314	310	302	325	275	323
Chloride mg/l				2.97												
Silica mg/l				6.38												
Dissolved solids				33.4												
Total hardness																
mg/l																
Color	80								209	204	209	207	201	217	183	215
Magnesium mg/l	10															
				7.78					9.33	4.37	8.75	10.50	9.72	9.72	3.89	9.72

1/ TNC too numerous to count in an undiluted sample. (300)

2/ Sample was filtered.

3/ Nephelometer Turbidity Units

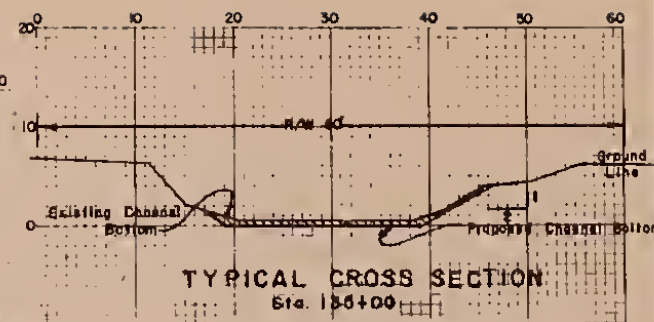
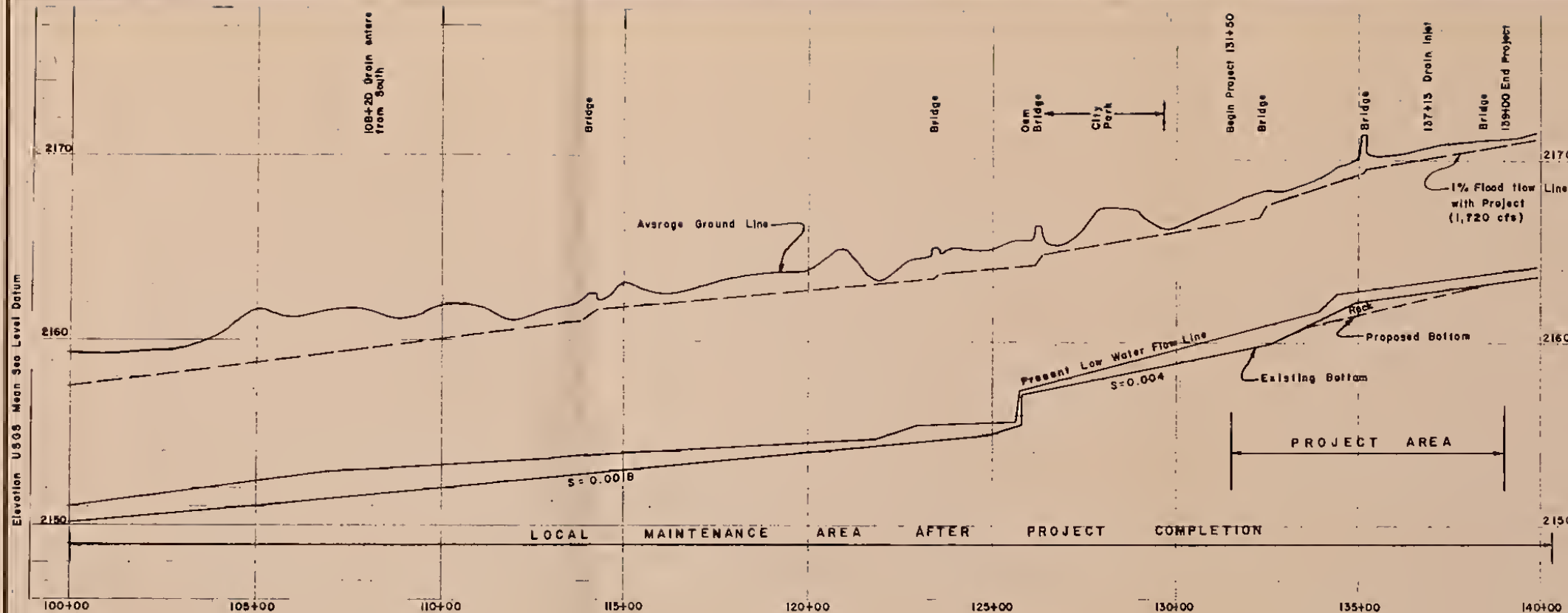
4/ Tests indicate positive for coliforms; actual counts not taken.

5/ Testing site 200' upstream from the confluence of Sherman Draw.

APPENDIX H

PRELIMINARY
ENGINEERING DRAWINGS





All elevations shown shall be referred to USGS mean sea level datum.

All bearings shown are grid bearings.

All coordinates shown on these drawings are on WASHINGTON GRID SYSTEM, North Zone.

WILBUR



OWNERSHIP

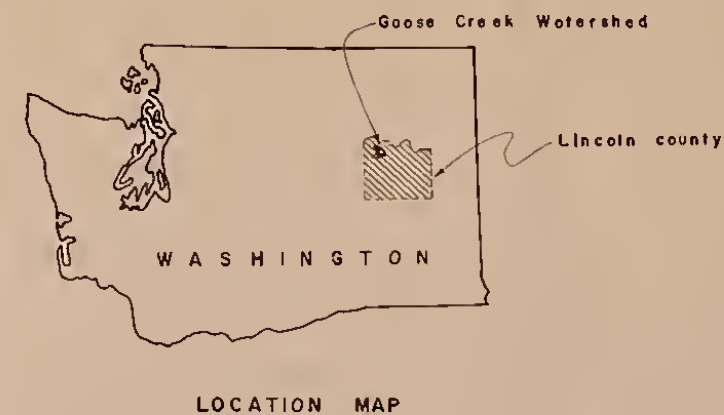
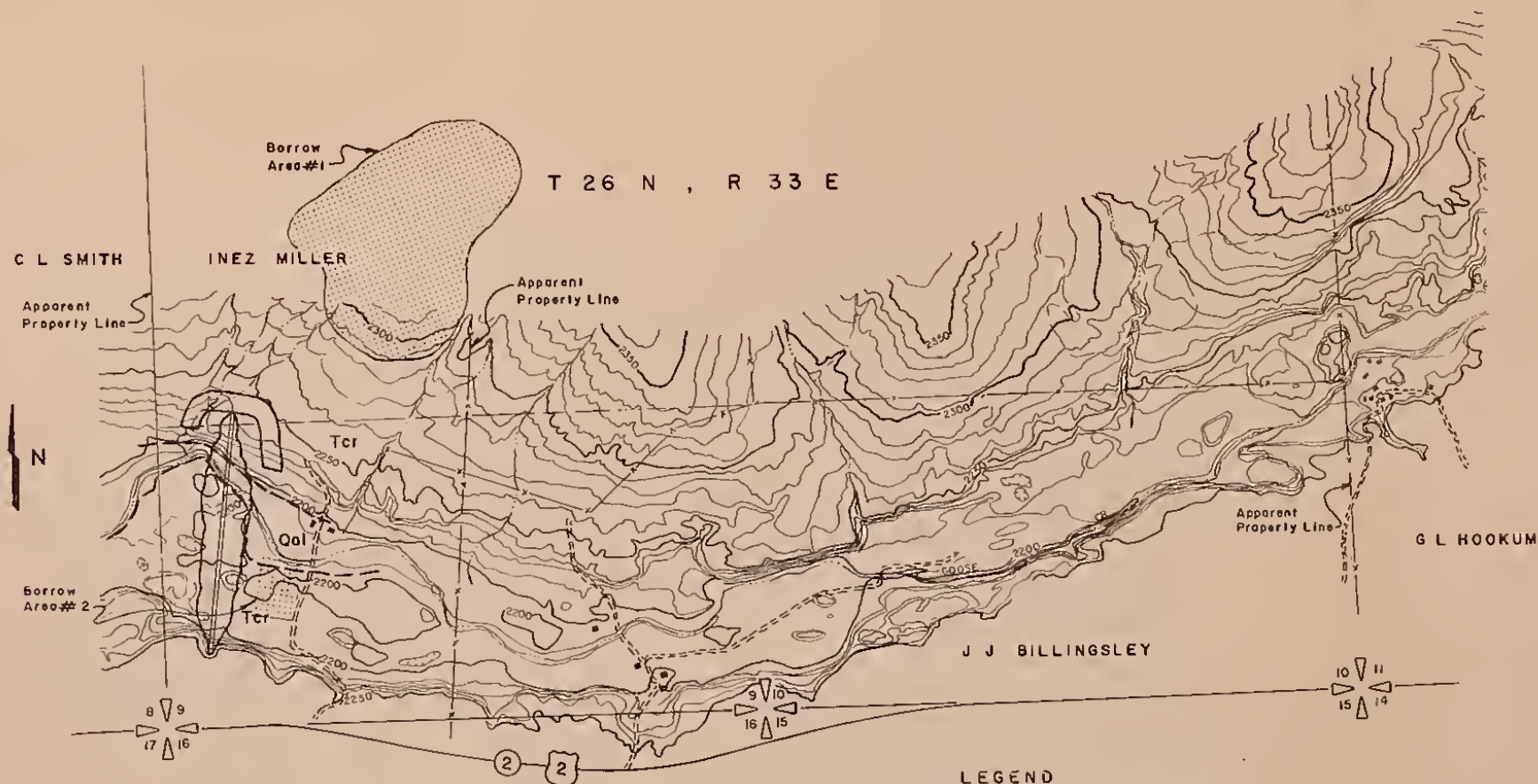
- | | |
|-----------------------------|--------------------------------|
| 1. Lincoln County | 21. M. Alexander |
| 2. H. Harms | 22. Williamson |
| 3. E. Hawsall | 23. P. Blair |
| 4. M. R. Roeman | 24. Correll Freight Co. |
| 5. I. L. Erickson | 25. Town of Wilbur |
| 6. E. W. McConnell | 26. State of Washington |
| 7. Burlington Northern R.R. | 27. Lincoln County |
| 8. Town of Wilbur | 28. Mo's Cofs |
| 9. M. E. Llewellyn | 29. John W. Sherwood |
| 10. L. Engelson | 30. S. Skinner |
| 11. I. Bonner | 31. N. H. Gelb |
| 12. L. M. Thomae | 32. Hanson, Inc. |
| 13. V. Sifton | 33. Washington Water Power Co. |
| 14. W. Mergel | 34. E. Orapar |
| 15. I. Torberk | 35. R. A. Houslen |
| 16. E. E. Ponley | 36. State of Washington |
| 17. Shell Oil Company | 37. C. Resvay |
| 18. B. Davis | 38. P. Poulsen |
| 19. F. W. Hanson | |
| 20. Gary Roark | |

200 0 200 400
SCALE IN FEET

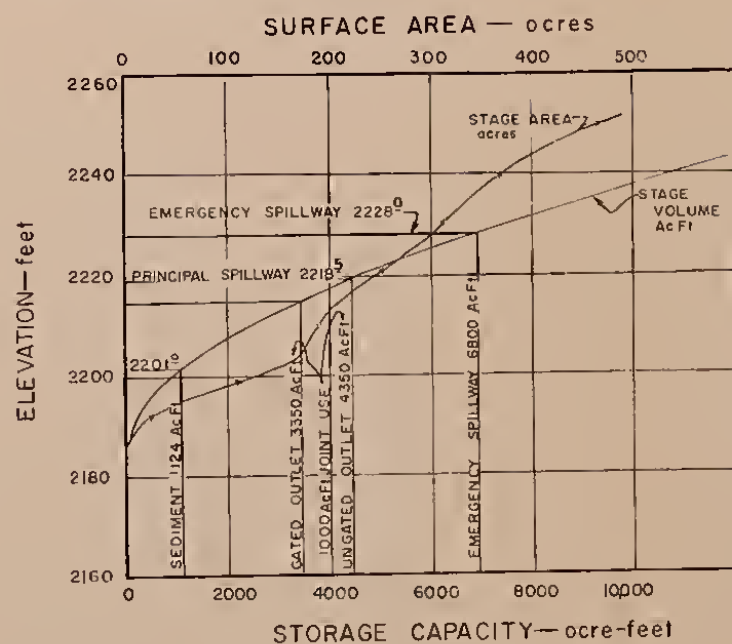
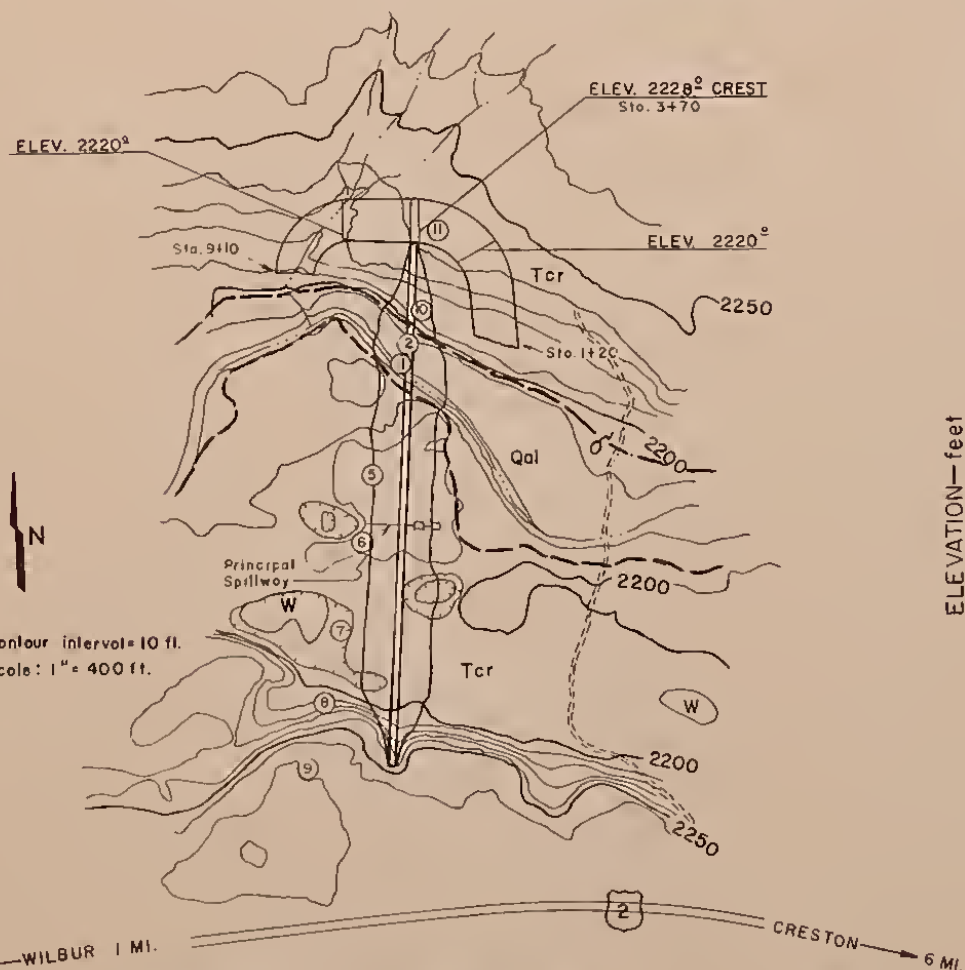
U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
ASSISTING LOCAL SPONSORING ORGANIZATIONS

PRELIMINARY PLANS
GOOSE CREEK WATERSHED, LINCOLN COUNTY, WASHINGTON
GOOSE CREEK CHANNEL WORK

DATE Nov. 1974	Sta. 100+00.00
DRAWN VM	Sta. 140+30.53
CHECKED <i>[initials]</i>	DWG NO.
APPROVED <i>[initials]</i>	SHEET 2 OF 7



- LEGEND
- Tcr Tertiary columbia river basalts
 - Qal Quaternary alluvial deposits
 - Spring
 - Geologic contact
 - W Water
 - ⑥ Test hole number & location
Detail Sheet 4 of 7



COMPACTED VOLUME

Embankment	
Core	149,000 CuYd
Rock Fill	149,000 CuYd
Cut-off	36,270 CuYd
Filter	60,800 CuYd

EXCAVATION VOLUMES

Spillway: Rock	62,200 CuYd
Cut-Off: Earth	36,270 CuYd
Rock	2,000 CuYd

CONCRETE VOLUMES

Encosement & Collars	92 CuYd
Intake Structure and Pedestals	35 CuYd

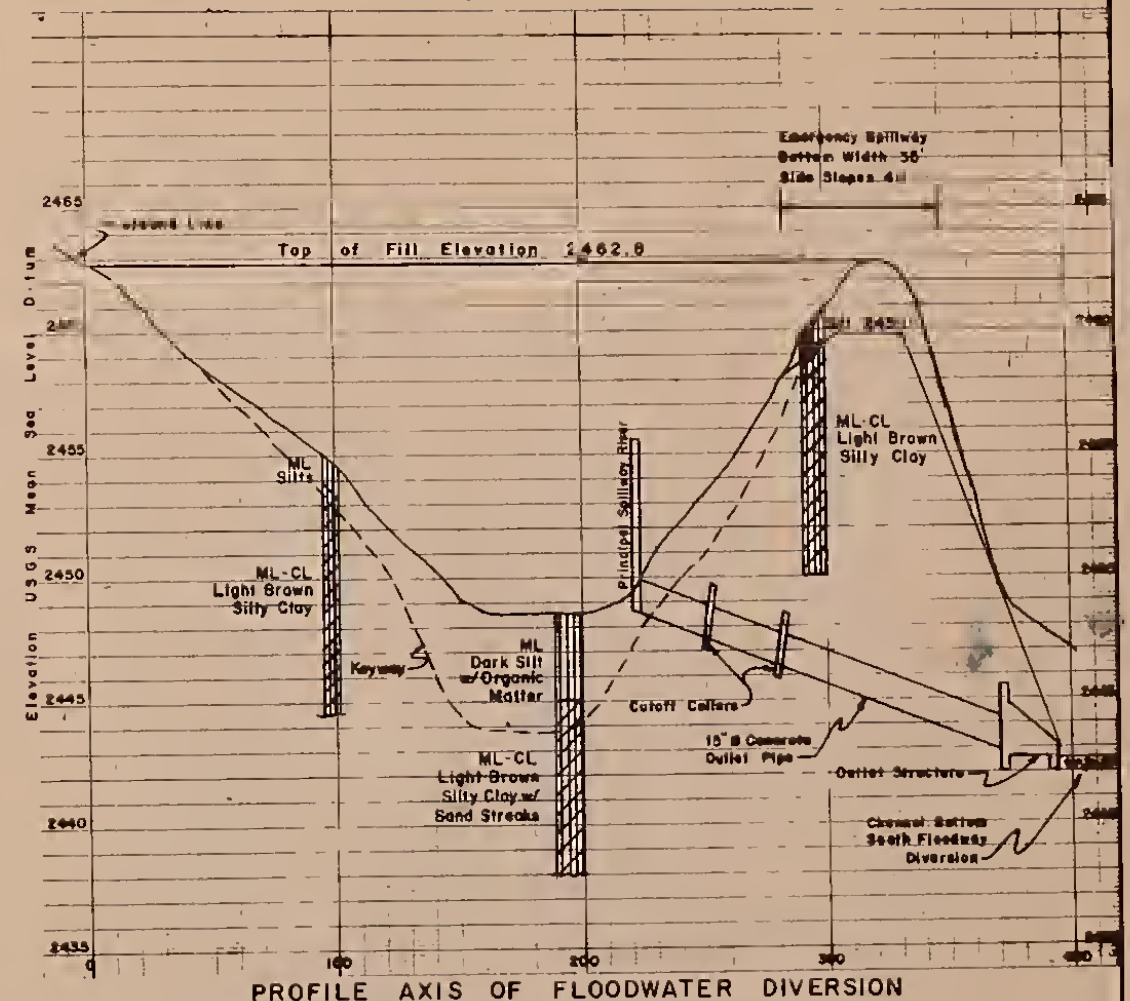
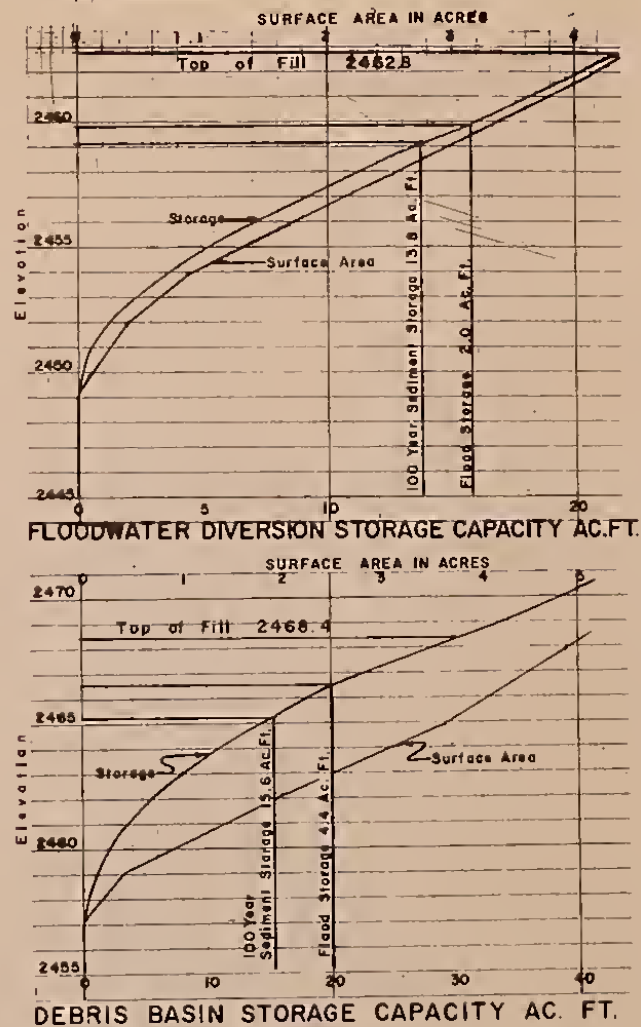
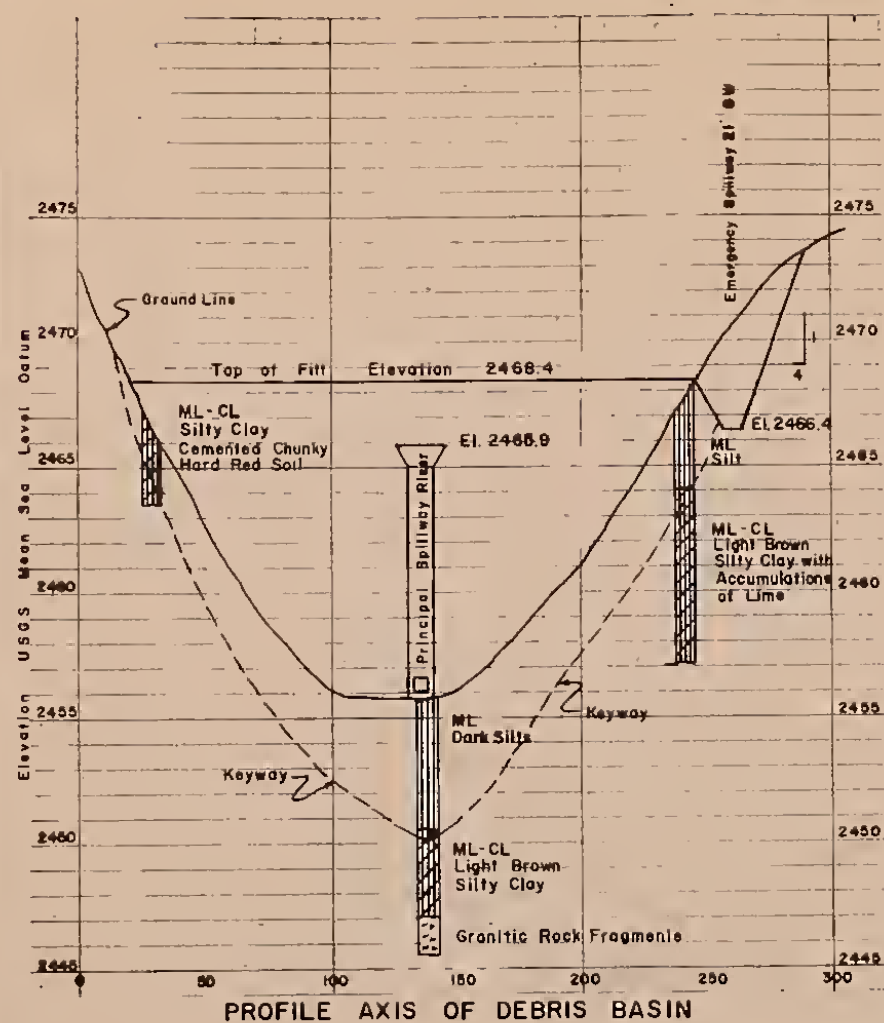
PIPE BARREL

48 inch diameter	160 Lin Ft
24 inch diameter	20 Lin Ft

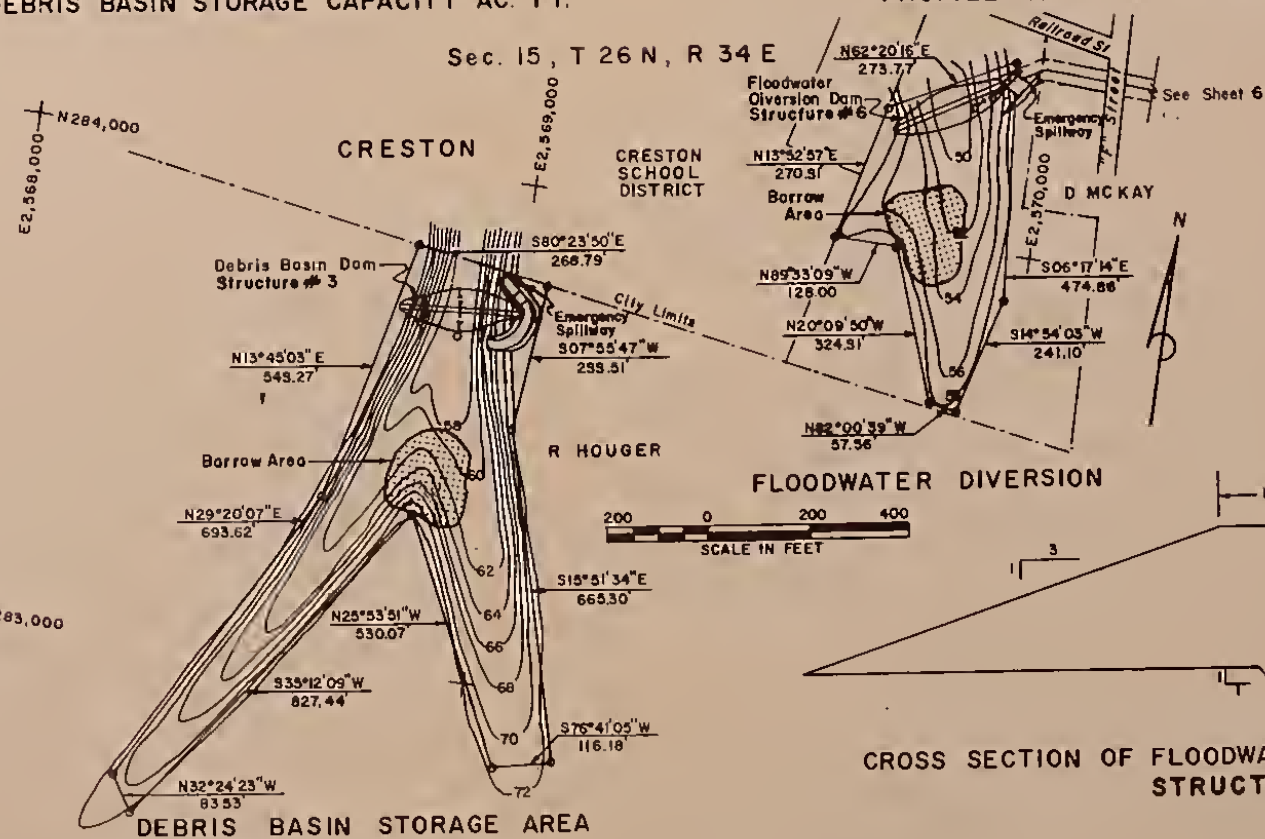
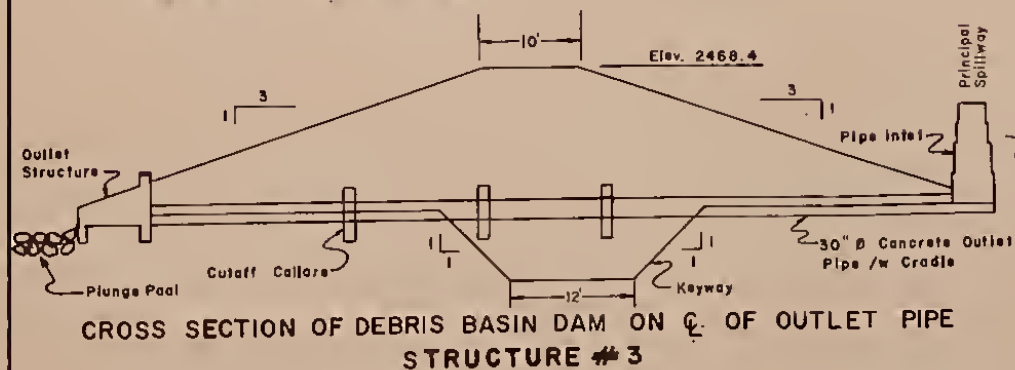
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SOIL CONSERVATION SERVICE
ASSISTING LOCAL SPONSORING ORGANIZATIONS

PRELIMINARY PLANS
GOOSE CREEK WATERSHED, LINCOLN COUNTY, WASHINGTON
PLAN OF STORAGE AREA AND DAM SITE

DATE Nov 1974	
DRAWN	
CHECKED	DWG NO.
APPROVED	SHEET 3 OF 7



QUANTITIES	
Excavation	625 CuYds
Keyway Trench	1500 CuYds
Emergency Spillway	3075 CuYds
Backfill and Fill	3075 CuYds
Embankment	3075 CuYds
Principal Spillway	3075 CuYds
30" Reinforced Concrete	90 Lin Ft
Reinforced Concrete	10 CuYds
Inlet Structure	8 CuYds
Outlet Structure	23 CuYds
Cutoff Collars and Cradle	23 CuYds



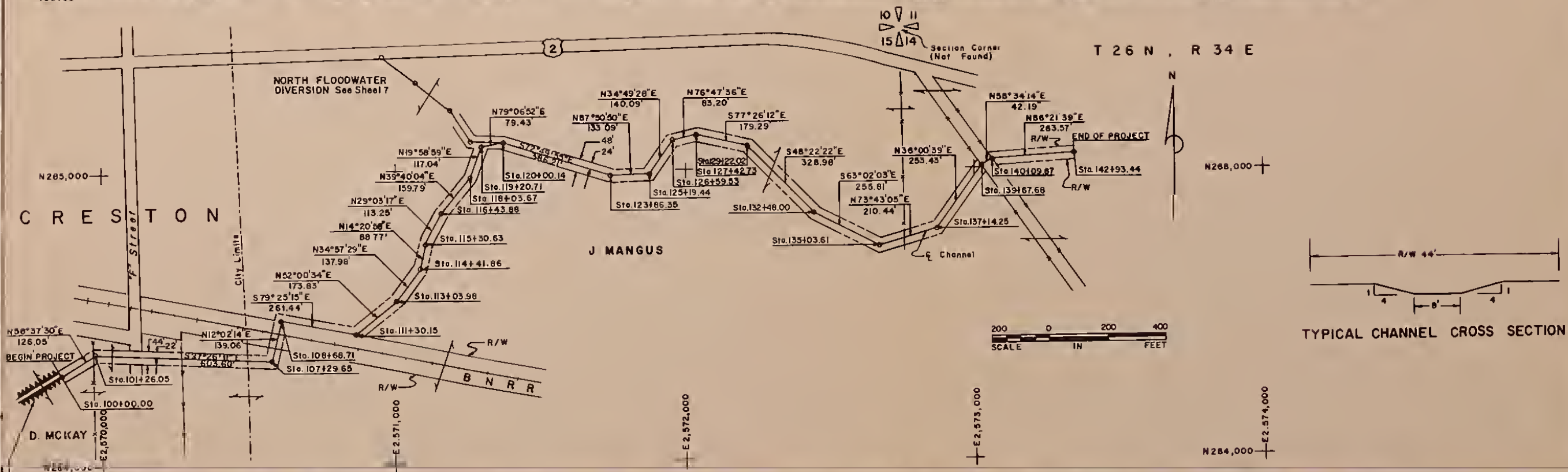
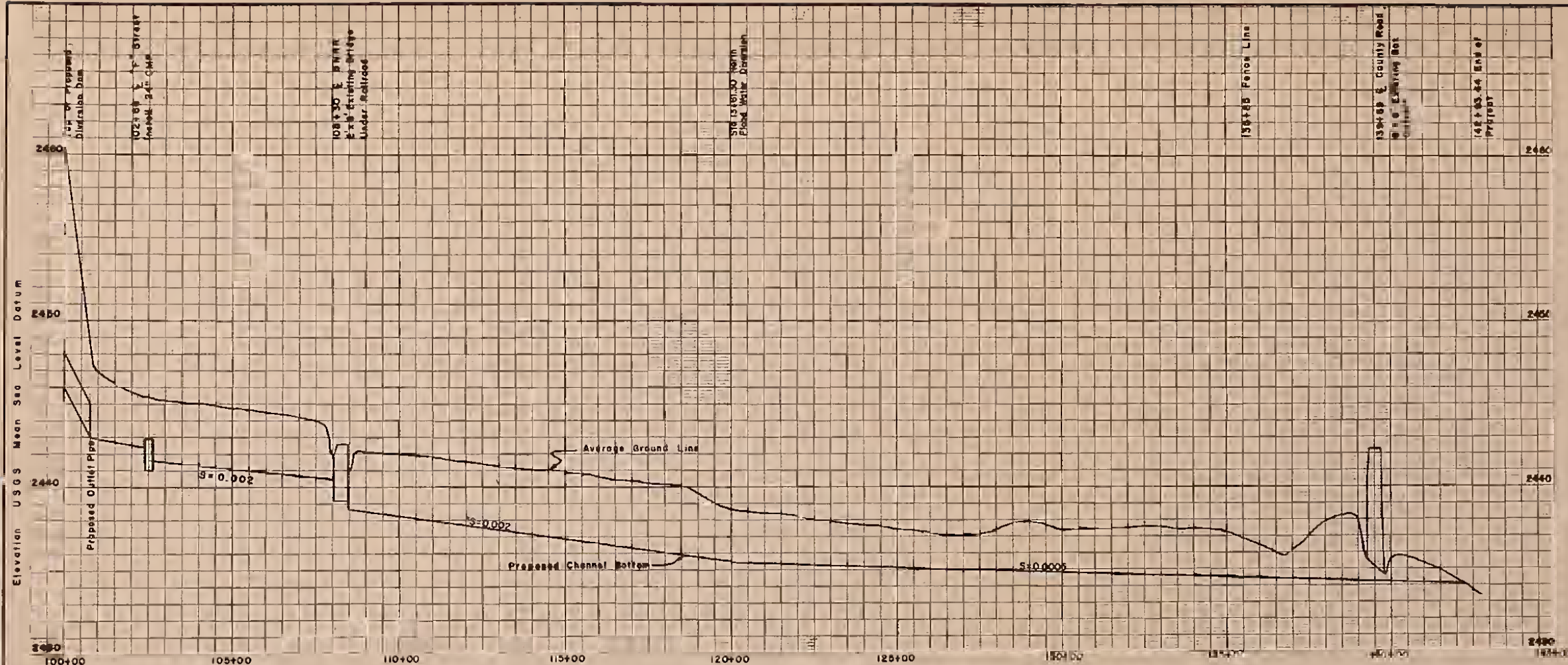
QUANTITIES	
Excavation	970 CuYds
Keyway Trench	1500 CuYds
Emergency Spillway	1500 CuYds
Backfill and Fill	3860 CuYds
Embankment	3860 CuYds
Principal Spillway	150 Lin Ft
15" Reinforced Concrete	150 Lin Ft
Reinforced Concrete	10 CuYds
Inlet Structure	8 CuYds
Outlet Structure	8 CuYds
Cutoff Collars	3 CuYds

CROSS SECTION OF FLOODWATER DIVERSION STRUCTURE #6

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
ASSISTING LOCAL SPONSORING ORGANIZATIONS

PRELIMINARY PLANS
GOOSE CREEK WATERSHED, LINCOLN COUNTY, WASHINGTON
DEBRIS BASIN AND DIVERSION DAM STRUCTURES - CRESTON AREA

DATE	Nov. 1974
DRAWN	VM
CHECKED	VM
APPROVED	VM
DWG NO.	
SHEET NO.	5 OF 7



U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
ASSISTING LOCAL SPONSORING ORGANIZATIONS

PRELIMINARY PLANS
GOOSE CREEK SOUTH FLOODWATER DIVERSION CHANNEL
LINCOLN COUNTY, WASHINGTON

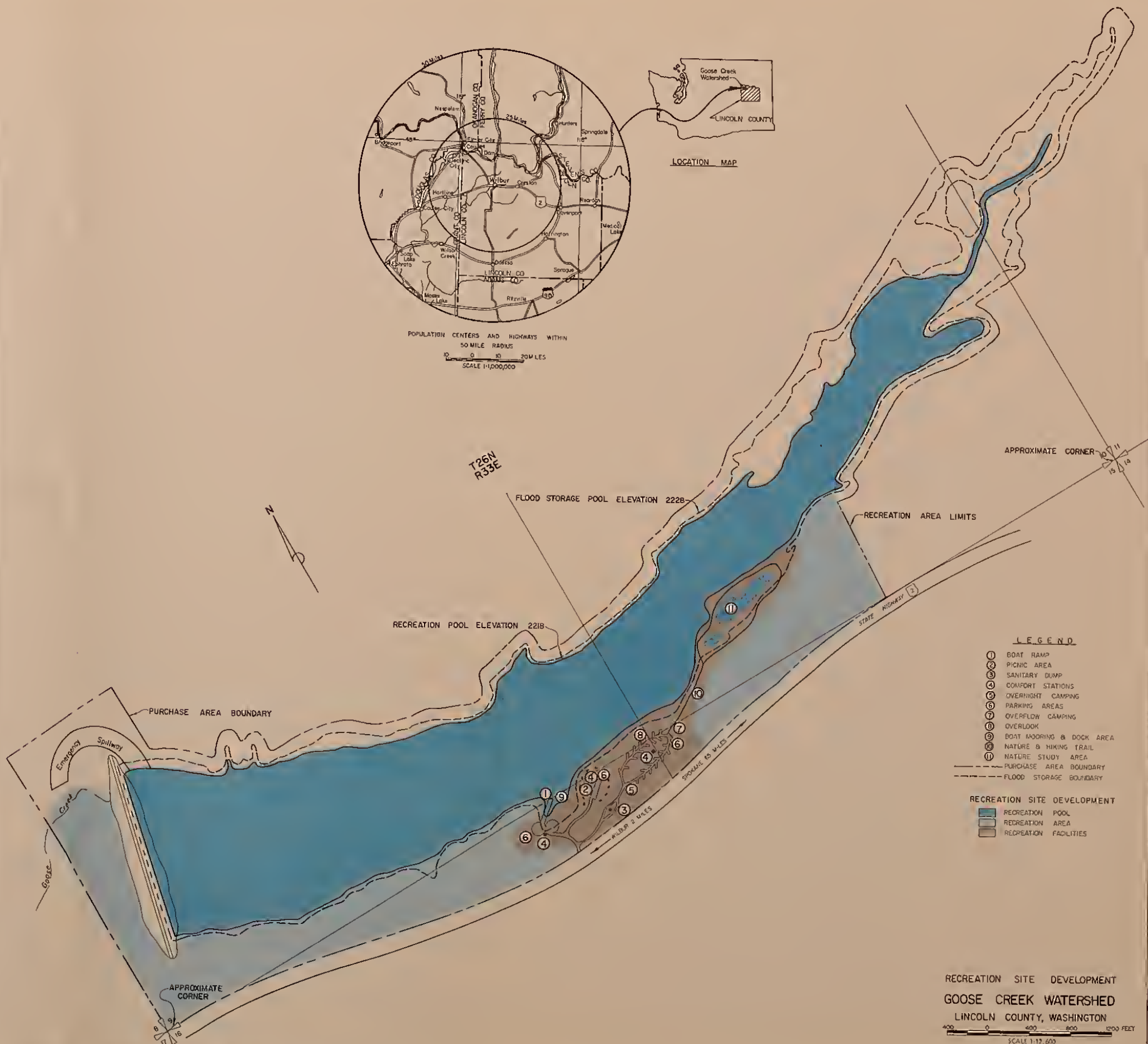
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DRAWN VM	Sta. 142+93.44
CHECKED WFW	DWG NO.
APPROVED	SHEET 6 OF 7



POPULATION CENTERS AND HIGHWAYS WITHIN
50 MILE RADIUS
SCALE 1:1,000,000



LOCATION MAP



LEGEND

- ① BOAT RAMP
- ② PICNIC AREA
- ③ SANITARY DUMP
- ④ COMFORT STATIONS
- ⑤ OVERNIGHT CAMPING
- ⑥ PARKING AREAS
- ⑦ OVERFLOW CAMPING
- ⑧ OVERLOOK
- ⑨ BOAT MOORING & DOCK AREA
- ⑩ NATURE & HIKING TRAIL
- ⑪ NATURE STUDY AREA

--- PURCHASE AREA BOUNDARY
--- FLOOD STORAGE BOUNDARY

RECREATION SITE DEVELOPMENT

- RECREATION POOL
- RECREATION AREA
- RECREATION FACILITIES

RECREATION SITE DEVELOPMENT
GOOSE CREEK WATERSHED
LINCOLN COUNTY, WASHINGTON

SCALE 1:12,600



